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GE80ET0105

COGENERATION TECHNOLOGY ALTERNATIVES STUDY (CTAS)

GENERAL ELECTRIC COMPANY
FINAL REPORT

VOLUME VI - COMPUTER DATA

PART 1 -- Coal-Fired Nocogeneration Process Boiler

Section A

W.F. Knightly

May, 1980

PREPARED FOR
National Aeronautics Space Administration
Lewis Research Center
Under Contract DEN3-31

FOR

U.S. Department of Energy
Office of Energy Technology
Division of Fossil Fuel Utilization

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FOREWORD

The Cogeneration Technology Alternatives Study (CTAS) was performed by the National Aeronautics and Space Administration, Lewis Research Center, for the Department of Energy, Division of Fossil Fuel Utilization. CTAS was aimed at providing information which will assist the Department of Energy in establishing research and development funding priorities and emphasis in the area of advanced energy conversion system technology for advanced industrial cogeneration applications. CTAS included two Department of Energy-sponsored/NASA-contracted studies conducted in parallel by industrial teams along with analyses and evaluations by the National Aeronautics and Space Administration's Lewis Research Center.

This document describes the work conducted by the Energy Technology Operation of the General Electric Company under National Aeronautics and Space Administration contract DEN3-31.

The General Electric Company contractor report for the CTAS study is contained in six volumes:

Cogeneration Technology Alternatives Study (CTAS), General Electric Company Final Report

Title	DOE Number	NASA Contract Report No.
GE Vol. 1 - Summary Report	DOE/NASA/0031-80/1	CR-159765
Vol. 2 - Analytic Approach	DOE/NASA/0031-80/2	CR-159766
Vol. 3 - Industrial Process Characteristics	DOE/NASA-0031-80/3	CR-159767
Vol. 4 - Energy Conversion System Characteristics	DOE/NASA-0031-80/4	CR-159768
Vol. 5 - Cogeneration System Results	DOE/NASA-0031-80/5	CR-159769
Vol. 6 - Computer Data	DOE/NASA-0031-80/6	CR-159770

Members of the technical staffs of the following organizations have developed and provided information for the General Electric Company Cogeneration Technology Alternatives Study. The contributions of these people in time, effort, and knowledge are gratefully appreciated.

General Electric Company

- Corporate Research and Development
- Energy Systems Programs Department
- Energy Technology Operation
- Gas Turbine Division
- Industrial and Marine Steam Turbine Division
- Industrial Turbine Sales and Engineering Operation
- Installation and Service Engineering Business Division
- Space Division
- TEMPO
- Lamp Components Division

DeLaval

Dow Chemical

General Energy Associates

Institute of Gas Technology

J.E. Sirrine

Kaiser Engineers

N.A. Philips

This General Electric Company contractor report is one of a set of reports describing CTAS results. The other reports are the following:

Cogeneration Technology Alternatives Study (CTAS), Vol. I, Summary Report, NASA TM-81400.

Cogeneration Technology Alternatives Study (CTAS), Vol. II, Comparison and Evaluation of Results, NASA TM-81401

Cogeneration Technology Alternatives Study (CTAS) - United Technologies Corporation Final Report

Title	DOE Number	NASA Contract Report No.
UTC Vol. 1 - Summary	DOE/NASA/0030-80/1	CR-159759
Vol. 2 - Industrial Process Characteristics	DOE/NASA-0030-80/2	CR-159760
Vol. 3 - Energy Conversion System Characteristics	DOE/NASA-0030-80/3	CR-159761
Vol. 4 - Heat Sources, Balance of Plant and Auxiliary Systems	DOE/NASA-0030-80/4	CR-159762
Vol. 5 - Analytic Approach & Results	DOE/NASA-0030-80/5	CR-159763
Vol. 6 - Computer Data	DOE/NASA-0030-80/6	CR-159764

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Section 1

SUMMARY

Cogeneration systems in industry simultaneously generate electric power and thermal energy. Conventional nocogeneration installations use separate boilers or furnaces to produce the required thermal energy and purchase electric power from a utility which rejects heat to the outside environment. Cogeneration systems offer significant savings in fuel but their wide spread implementation by industry has been generally limited by economics and institutional and regulatory factors. Because of potential savings to the nation, the Department of Energy, Office of Energy Technology sponsored the Cogeneration Technology Alternatives Study (CTAS). The National Aeronautics & Space Administration, Lewis Research Center, conducted CTAS for the Department of Energy with the support of Jet Propulsion Laboratory and study contracts with the General Electric Company and the United Technologies Corporation.

OBJECTIVES

The objective of the CTAS is to determine if advanced technology cogeneration systems have significant payoff over current cogeneration systems which could result in more widespread implementation in industry and to determine which advanced cogeneration technologies warrant major research and development efforts.

Specifically, the objectives of CTAS are:

1. Identify and evaluate the most attractive advanced energy conversion systems for implementation in industrial cogeneration systems for the 1985-2000 time period which permit use of coal and coal-derived fuels.

2. Quantify and assess the advantages of using advanced technology systems in industrial cogeneration.

SCOPE

The following nine energy conversion system (ECS) types were evaluated in CTAS:

1. Steam turbine
2. Diesel engines
3. Open-cycle gas turbines
4. Combined gas turbine/steam turbine cycles
5. Stirling engines
6. Closed-cycle gas turbines
7. Phosphoric acid fuel cells
8. Molten carbonate fuel cells
9. Thermionics

In the advanced technology systems variations in temperature, pressure ratio, heat exchanger effectiveness and other changes to a basic cycle were made to determine desirable parameters for many of the advanced systems. Since coal and coal-derived fuels were emphasized, atmospheric and pressurized fluid bed and integrated gasifiers were evaluated.

For comparison, currently available non-condensing steam turbines with coal-fired boilers and flue gas desulfurization, gas turbines with heat recovery steam generators burning residual and distillate petroleum fuel and medium speed diesels burning petroleum distillate fuel were used as a basis of comparison with the advanced technologies.

In selecting the cogeneration energy conversion system configurations to be evaluated, primary emphasis was placed on system concepts fired by coal and coal-derived fuels. Economic evaluations were based on industrial ownership of the cogeneration system. Solutions to institutional and regulatory problems which impact the use of cogeneration were not addressed in this study.

Over fifty industrial processes and a similar number of state-of-the-art and advanced technology cogeneration systems were matched by

General Electric to evaluate their comparative performance. The industrial processes were selected as potentially suited to cogeneration primarily from the six largest energy consuming sectors in the nation. Advanced and current technology cogeneration energy conversion systems, which could be made commercially available in the 1985 to 2000 year time frame, were defined on a consistent basis. These processes and systems were matched to determine their effectiveness in reducing fuel requirements, saving petroleum, cutting the annual costs of supplying energy, reducing emissions, and improving the industry's return on investment.

Detailed data were gathered on 80 process plants with major emphasis on the following industry sectors:

1. SIC20 - Food and Kindred Products
2. SIC26 - Pulp and Paper Products
3. SIC28 - Chemicals
4. SIC29 - Petroleum Refineries
5. SIC32 - Stone, Clay and Glass
6. SIC33 - Primary Metals

In addition, four processes were selected from SIC22 - Textile Mill Products and SIC24 - Lumber and Wood Products. The industry data includes current fuel types, peak and average process temperature and heat requirements, plant operation in hours per year, waste fuel availability, electric power requirements, projected growth rates to the year 2000, and other factors needed in evaluating cogeneration systems. From this data approximately fifty plants were selected on the basis of: energy consumption, suitability for cogeneration, availability of data, diversity of types such as temperatures, load factors, etc., and range of ratio of process power over process heat requirements.

Based on the industrial process requirements and the ECS characteristics, the performance and capital cost of each cogeneration system and its annual cost, including fuel and operating costs, were compared with nocogeneration systems as currently used. The ECS was either sized to

match the process heat requirements (heat match) and electricity either bought or sold or sized to match the electric power (power match) in which case an auxiliary boiler is usually required to supply the remaining heat needs. Cases where there was excess heat when matching the power were excluded from the study. With the fuel variations studied there are 51 ECS/fuel combinations and over 50 processes to be potentially matched in both heat and power resulting in a total of approximately 5000 matches calculated. Some matches were excluded for various reasons; e.g., the ECS out of temperature range or excess heat produced, resulting in approximately 3100 matches carried through the economic evaluation. Results from these matches were extrapolated to the national level to provide additional perspective on the comparison of advanced systems.

RESULTS

A comparison of the results for these specific matches lead to the following observations on the various conversion technologies:

1. The atmospheric and pressurized fluidized bed steam turbine systems give payoff compared to conventional boiler with flue gas desulfurization-steam turbine systems which already appear attractive in low and medium power over heat ratio industrial processes.

2. Open-cycle gas turbine and combined gas turbine/steam turbine systems are well suited to medium and high power over heat ratio industrial processes based on the fuel prices used in CTAS. Regenerative and steam injected gas turbines do not appear to have as much potential as the above systems, based on GE results. Solving low grade coal-derived fuel and NO_x emission problems should be emphasized. There is payoff in these advanced systems for increasing firing temperature.

3. The closed-cycle gas turbine systems studied by GE have higher capital cost and poorer performance than the more promising technologies.

4. Combined-cycle molten carbonate fuel cell and gas turbine/steam turbine cycles using integrated gasifier, and heat matched to medium and high power over heat ratio industrial processes and exporting surplus power to the utility give high fuel savings. Because of their high capital cost, these systems may be more suited to utility or joint utility-industry ownership.

5. Distillate-fired fuel cells did not appear attractive because of their poor economics due to the low effectiveness of the cycle configurations studied by GE and the higher price of distillate fuel.

6. The very high power over heat ratio and moderate fuel effectiveness characteristics of diesel engines limit their industrial cogeneration applications. Development of an open cycle heat pump to increase use of jacket water for additional process heat would increase their range of potential applications.

To determine the effect of the national fuel consumption and growth rates of the various industrial processes together with their distribution of power to heat ratios, process steam temperatures and load factors, each energy conversion system was assumed implemented without competition and its national fuel, emissions, and cost of energy estimated. In this calculation it was assumed that the total savings possible were due to implementing the cogeneration systems in new plants added because of needed growth in capacity or to replace old, unserviceable process boilers in the period from 1985 to 1990. Also, only those cogeneration systems giving an energy cost savings compared with nocogeneration were included in estimating the national savings. Observations on these results are:

1. There are significant fuel, emissions, and energy cost savings realized by pursuing development of some of the advanced technologies.

2. The greatest payoff when both fuel energy savings and economics are considered lies in the steam turbine systems using atmospheric and pressurized fluidized beds. In a comparison of the national fuel and energy cost savings for heat matched cases, the atmospheric fluidized bed showed an 11% increase in fuel saved and 60% additional savings in levelized annual energy cost savings over steam turbine systems using conventional boilers with flue gas desulfurization whose fuel savings would be, if implemented, 0.84 quads/year and cost savings $1.9 billion/year. The same comparison for the pressurized fluidized bed showed a 73% increase in fuel savings and a 29% increase in energy cost savings.

3. Open-cycle gas turbines and combined-cycles have less wide application but offer significant savings. The advanced residual-fired open-cycle gas turbine with heat recovery steam generator and firing temperature of 2200 F were estimated to have a potential national saving of 39% fuel and 27% energy cost compared to currently available residual-fired gas turbines whose fuel savings would be, if implemented, 0.18 quads/year and cost savings $0.33 billions/year.

4. Fuel and energy cost savings are several times higher when the cogeneration systems are heat matched and surplus power exported to the utility than when the systems are power matched.

Other important observations made during the course of performing CTAS were:

1. Comparison of the cogeneration systems which are heat matched and usually exporting power to the utility with the power matched systems shows the systems exporting power have a much higher energy savings, often reaching two to five times the power match cases. In the past, with few exceptions, cogeneration systems have been matched to the industrial process so as not to export power because of numerous load management, reliability, regulatory, economic and institutional reasons. A concerted effort is now underway by a number of government agencies, industries, and utilities to overcome these impediments and it should be encouraged if the nation is to receive the full potential of industrial cogeneration.

2. The economics of industrially owned cogeneration plants are very sensitive to fuel and electric power costs or revenues. Increased price differentials between liquid fuels and coal would make integrated gasifier fuel cell or combined-cycle systems attractive for high power over heat industrial processes.

3. Almost 75% of the fuel consumed by industrial processes studied in CTAS, which are representative of the national industrial distribution, have power over heat ratios less than 0.25. As a result energy conversion systems, such as the steam turbine using the atmospheric or pressurized fluidized bed, which exhibit good performance and economics when heat matched in the low power over heat ratio range, give the largest national savings.

Section 2

INTRODUCTION

BACKGROUND

Cogeneration is broadly defined as the simultaneous production of electricity or shaft power and useful thermal energy. Industrial cogeneration in the context of this study refers specifically to the simultaneous production of electricity and process steam or hot water at an individual industrial plant site. A number of studies addressing various aspects of cogeneration as applied to industry have been made in the last few years. Most of these focused on the potential benefits of the cogeneration concept. CTAS, however, was concerned exclusively with providing technical, cost, and economic comparisons of advanced technology systems with each other and with currently available technologies as applied to industrial processes rather than the merits of the concept of cogeneration.

While recognizing that institutional and regulatory factors strongly impact the feasibility of widespread implementation of cogeneration, the CTAS did not attempt to investigate, provide solutions, or limit the technologies evaluated because of these factors. For example, cogeneration systems which were matched to provide the required industrial process heat and export excess power to the utilities were evaluated (although this has usually not been the practice in the past) as well as systems matched to provide only the amount of power required by the process. Also, no attempt was made to modify the industrial processes to make them more suitable for cogeneration. The processes were defined to be representative of practices to be employed in the 1985 to 2000 time frame.

The cogeneration concept has been applied in a limited fashion to power plants since the turn of the century. Their principal advantage is that they offer a significant saving in fuel over the conventional method of supplying the energy requirements of an industrial plant by purchasing power from the utility and obtaining steam from an on-site process boiler.

The saving in fuel by a cogeneraiton system can be seen by taking a simple example of an industrial process requiring 20 units of power and 100 units of process steam energy. A steam turbine cogeneration system (assuming it is perfectly matched, which is rarely the case) can provide these energy needs with fuel effectiveness or power plus heat over input fuel ratio of 0.85 resulting in a fuel input of 141 units. In the conventional nocogeneration system the utility with an efficiency of 33% requires 60 units of fuel to produce the 20 units of power and the process boiler with an efficiency of 85% requires 118 units of fuel to produce the required steam making a total fuel required of 178 units. Thus the cogeneration system has a fuel saved ratio of 37 over 178 or 21%.

In spite of this advantage of saving significant amounts of fuel, the percentage of industrial power generated by cogeneration, rather than being purchased from a utility, has steadily dropped until it is now less than 5% of the total industrial power consumed. Why has this happened? The answer is primarily one of economics. The utilities with their mix in ages and capital cost of plants, relative low cost of fuel, steadily improving efficiency and increasing size of power plants all made it possible to offer industrial power at rates more attractive than industry could produce it themselves in new cogeneration plants.

Now with long term prospects of fuel prices increasing more rapidly than capital costs, the increased use of waste fuels by industry and the need to conserve scarce fuels, the fuel savings advantage of cogenerating will lead to its wider implementation. The CTAS was sponsored by the US Department of Energy to obtain the input needed to establish R&D funding priorities for advanced energy conversion systems which could be used in industrial cogeneration applications. Many issues, technical, institutional

and regulatory, need to be addressed if industrial cogeneration is to realize its full potential benefits to the nation. However, the CTAS concentrated on one portion of these issues, namely, to determine from a technical and economic standpoint the payoff of advanced technologies compared to currently available equipments in increasing the implementation of cogeneration by industry.

OBJECTIVE, OVERALL SCOPE, AND METHODOLOGY

The objectives of the CTAS effort were to:

1. Identify and evaluate the most attractive advanced conversion systems for implementation in industrial cogeneration systems for the 1985-2000 time period which permit increased use of coal or coal-derived fuels.
2. Quantify and assess the advantages of using advanced technology systems in industrial cogeneration.

To select the most attractive advanced cogeneration energy conversion systems incorporating the nine technologies to be studied in the CTAS, a large number of configurations and cycle variations were identified and screened for detail study. The systems selected showed desirable cogeneration characteristics and the capability of being developed for commercialization in the 1985 to 2000 year time frame. The advanced energy conversion system-fuel combinations selected for study are shown in Table 2-1 and the currently available systems used as a basis of comparison are shown in Table 2-2. These energy conversion systems were then heat matched and power matched to over 50 specific industrial processes selected primarily from the six major energy consuming industrial sectors of food; paper and pulp; chemicals; petroleum refineries; stone, clay and glass; and primary metals. Several processes were also included from wood products and textiles.

On each of these matches analyses were performed to evaluate and compare the advanced technology systems on such factors as:

- Fuel Energy Saved
- Flexibility in Fuel Use

Table 2-1

GE-CTAS ADVANCED TECHNOLOGY COGENERATION ENERGY CONVERSION SYSTEMS MATCHED TO FUELS

	Coal	Coal Derived Liquids: Residual	Coal Derived Liquids: Distillate
Steam Turbine	AFB*	Yes	---
Pressurized Fluid Bed	Yes	---	---
Gas Turbine			
Open Cycle-HRSG	---	Yes	Yes
Regenerative	---	---	Yes
Steam Injected	---	Yes	---
Combined Gas Turbine/Steam Turbine Cycle			
Liquid Fired	---	Yes	---
Integrated Gasifier Combined Cycle	Yes	---	---
Closed Cycle-Helium Gas Turbine	AFB	---	---
Thermionic			
HRSG	FGD*	Yes	---
Steam Turbine Bottomed	FGD	Yes	---
Stirling	FGD	Yes	Yes
Diesels			
Medium Speed	---	Yes	Yes
Heat Pump	---	Yes	Yes
Phosphoric Acid Fuel Cell Reformer	---	---	Yes
Molten Carbonate Fuel Cell			
Reformer	---	---	Yes
Integrated Gasifier			
HRSG	Yes	---	---
Steam Turbine Bottoming	Yes	---	---

* AFB - Atmospheric Fluidized Bed
FGD - Flue Gas Desulfurization

Table 2-2

GE-CTAS STATE OF ART COGENERATION ENERGY CONVERSION MATCHED TO FUELS

	Coal	Petroleum Derived: Residual	Petroleum Derived: Distillate
Steam Turbine	FGD	Yes	---
Gas Turbine	---	Yes	Yes
Diesel	---	Yes	Yes

- Capital Costs
- Return on Investment and Annual Energy Cost Saved
- Emissions
- Applicability to a Number of Industries.

These matches were evaluated, both on a specific process site basis, and on a national level where it was assumed that each ECS is applied without competition nationwide to all new applicable industrial plants.

Because of the many different types of conversion systems studied and myriad of possible combinations of conversion system and process options, key features of the study were:

- The use of consistent and simplified but realistic characterizations of cogeneration systems
- Use of the computer to match the systems and evaluate the characteristics of the matches.

A major effort was made to strive for consistency in the performance, capital cost, emissions, and installation requirements of the many advanced cogeneration energy conversion systems. This was accomplished first by NASA-LeRC establishing a uniform set of study groundrules for selection and characterization of the ECS's and industrial processes, calculation of fuel and emissions saved and analysis of economic parameters such as levelized annual energy cost and return on investment. These groundrules and assumptions are described in Section 3. Second, in organizing the study, as shown in Figure 2-1, GE made a small group called Cogeneration Systems Technology responsible for establishing the configuration of all the ECS's and obtaining consistent performance, cost and emission characteristics for the advanced components from the GE organizations or subcontractors developing these components. This team, using a standard set of models for the remaining subsystems or components, then prepared the performance, capital costs, and other characteristics of the overall ECS's. As a result, any component or subsystem, such as fuel storage and handling, heat recovery steam generator or steam turbine, appearing in

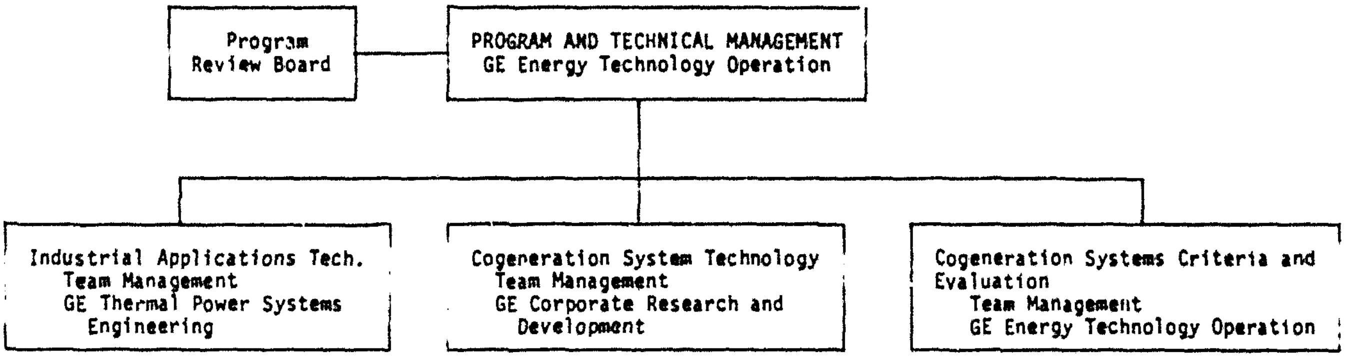

Figure 2-1. GE-CTAS Project Organization

more than one type ECS is based on the same model. This method reduces the area of possible inconsistency to the advanced component which, in many ECS's, is a small fraction of the total system. The characterization of the ECS's is described in Sections 5 and 6. The functions of obtaining consistent data on industrial processes from the industrial A&E subcontractors was the responsibility of the Industrial Applications Technology group and is described in Section 4. Matching of the ECS's and processes and making the overall performance and economic evaluations and comparisons was the responsibility of Cogeneration Systems Criteria and Evaluation. The methodology of matching the cogeneration systems is detailed in Section 8, the results of the performance analysis in Section 9, economic analysis in Section 10, the national savings in Section 11, and overall results and observations in Section 12.

Section 12

This volume contains a description of the computer system analysis and the final version of all the principal computer analysis reports prepared on the GE-CTAS. The computer system analysis section discusses how the computer system was used in this study and describes the industrial process, energy conversion system performance and capital cost and economic data bases. The computer program logic and system flow charts are described where necessary and the system output reports are discussed. Part I of the computer reports uses a coal-fired process boiler with flue gas desulfurization as the nocogeneration system base of comparison except for processes with small steam requirements and Part 2 uses a residual-fired process boiler as the nocogeneration base. These reports contain an immense amount of data on fuel consumption, fuel saved and economics of the ECS's matched to the various industrial process and serve as a consistent data base not only for the evaluations performed during CTAS but for future studies.

COMPUTER SYSTEMS ANALYSIS & OUTPUT REPORT DESCRIPTIONS

INTRODUCTION

The computer system designed for CTAS was used extensively for the analysis of all cogeneration options addressed in the study. The objective of this section is to describe how the computer system was used in this study. In the discussion that follows the process and economic data bases are described, the computer program logic and system flow charts are described where necessary, and typical reports are shown.

INDUSTRIAL PROCESS DATA BASE

An extremely large volume of data was gathered during the industrial process characterization. The computer system flow chart for handling

the process data is shown in Figure 12-1. Specific items (Table 12-1) needed for the systems analysis were extracted from this data and entered into the process data base using the form shown in Table 12-2.

Creating and Updating

The computer program NEWPROC creates the data base by using questions and answers at a timesharing terminal. Updates to the data base utilize the same input form (Table 12-2) and are processed through program CHGPROC. This results in specific changes to specific processes. The output of this program contains only those process descriptions updated so that the updated processes may be verified before merging with the entire data base. Program PROCMAS updates each process with a general change.

Reports From Process Data

Two reports are generated from the process data base. Program GEN2.1 generates a detailed report of all data stored for this process. Figure 12-2 shows a typical page from this report. This program (GEN2.1) operates on the entire data base or on a portion of the data base containing only those processes recently updated.

Program GEN2.2 generates a summary report of the process data to be used in matching the ECS performance curves. Figure 12-3 shows one page of this summary report. The contents of this report are described in Table 12-3. This program reads a file created by a program (BART) that reads the process data base, accesses the steam tables and generates the reduced process data file for ECS matching. The computer process data file used in preparing the computer reports in this volume is shown in Table 12-4.

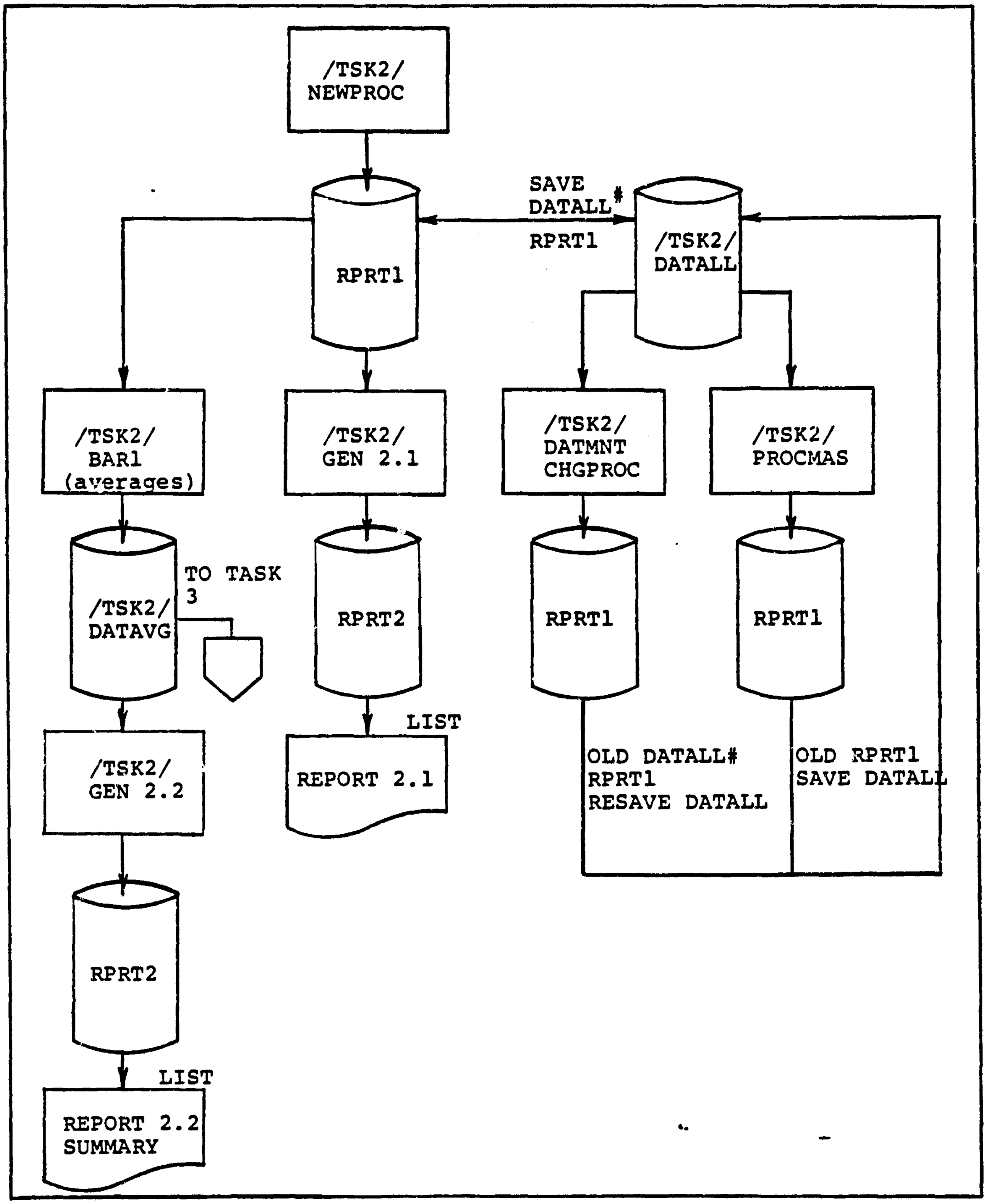

Figure 12-1. Industrial Process Data Handling - Data Base Creating, Updating and Reporting

Table 12-1

CONTENTS OF CTAS INDUSTRIAL PROCESS DATA BASE

SIC Code.

Process Description.

Product.

Plant Size.

Steam Requirements (maximum of 3): flow, psig, % return, temperature of return.

Other Heat to Process: Description, Btu/hr, temperature.

Operational Time: Hr/yr.

Large Horsepower Loads: Number, horsepower, type drive.

Waste Heat Streams (maximum of 3): Type, flow, temperature, service.

Fuel: Type and quantity (maximum of 2).

By-Product Fuel: Type and quantity.

Number of New Plants.

Process Status.

Anticipated Changes.

Plant Size in 1978 and 2000.

Economic Criteria for Investment and Hurdle Rate.

Industrial Investment Level in 1985 to 2000.

National Capacity in 1978 and 2000.

National Energy Consumed in 1978, 1985 and 2000.

Cost of Energy as Percent of Operating Cost.

Table 12-2

CTAS PROCESS DATA INPUT FORM

SIC Code _ _ _ _

Process # _ _ _

CHANGE CODE

1 Description ____________________

2 Plant size ____________

3 Plant UM __________

4 KWAVG, KWPEAK ________, ________

5 Steam Loads 1. ______, ______, ______, ______
Flow,PSIG,%,Temp. 2. ______, ______, ______, ______
3. ______, ______, ______, ______

6 Other:Type,BTU,Temp. ______, ______, ______

7 Operating Hours/Yr ______

8 Large HP:#,Total,Type ______, ______, ______

9 Waste Heat:Type,Flow,T,Serv 1. ______, ______, ______, ______
2. ______, ______, ______, ______
3. ______, ______, ______, ______

10 Fuels:Type,Qty 1. ______, ______
2. ______, ______
3. ______, ______

11 Number New Plants ______

12 Economic Criteria ______
ROI ______

13 Capital Invest:$,X10** ______, ______

14 Old or New ______

15 National Capacity:78,2K,UM ______, ______, ______

16 Process Changes ______

20 Growth (%) ______

17 National Energy:78,85,2K ______, ______, ______ (Btu/hr*10**12)

18 Plant Size:78,2K,UM ______, ______, ______

19 Cost of Electricity ______

0 Ends this process & writes

GENERAL ELECTRIC CO.

DATE 11/16/78 TIME 17.66 · SIC CODE 2011
163E ADV DESIGN ENGR

CTAS INDUSTRIAL PROCESS DATA BANK INFORMATION PROCESS 1

PROCESS DESCRIPTION MEAT-PACKING PRODUCTS MEAT-LARD SIZE 100 TPD

SYSTEM LOADS	FUELS-PROCESS-PLANT-STATUS	ECONOMIC-NATIONAL FACTOR

KILOWATTS AVG 1940 KILOWATTS PEAK 2330

STEAM REQUIREMENTS*PROCESS+HEATING*

	FLOW LB/HR 10**3	PSIG	PERCENT RETURN	TEMP RETURN		FUEL TYPE	MILLIONS BTU/HR QUANTITY		
1.	24.	15.	25.	180.	PRIMARY	GAS	27.0	ECONOMIC CRITERIA	DRR
2.	0.	0.	0.	0.	SECONDARY	OTHER	15.0	EXPECTED ROI	0.
3.	0.	0.	0.	0.	BY-PRODUCT	0	0.	INVESTMENT LEVEL 1985-2000* $ BILLIONS*	4.80M

OTHER HEAT TO PROCESS — NATIONAL CAPACITY
DIRECT

MILLIONS OF BTU/HR 2. — NUMBER OF NEW PLANTS 30 — MILLIONS OF TPY
TEMPERATURE 800. — PROCESS STATUS- OLD — 1978 18.00
OPERATIONAL HOURS PER YEAR 2100 — ANTICIPATED PROCESS CHANGES NONE — 2000 23.00

LARGE HORSEPOWER LOADS

NUMBER 1
TOTAL HP 320 — PLANT SIZE TPD
TYPE DRIVE MOTOR — 1978 100
WASTE HEAT STREAMS — 2000 150

TYPE	FLOW LB/HR 10**3	TEMP	SERVICE
1.AIR	120.	450.	BOILER-S
2.VAPOR	34.	200.	COOK
3.AIR	25.	475.	COOK-STA

NATIONAL ENERGY CONSUMED TRILLIONS BTU PER YEAR

1978	117.000
1985	132.000
2000	161.000

COST OF ENERGY AS % OF OPERATING COST 8.

Figure 12-2. Typical Data Base Report

ORIGINAL PAGE IS OF POOR QUALITY

DATE 11/10/78 TIME 8.75
I&SE-ADV. DESIGN ENGR.

GENERAL ELECTRIC CO.
COGENERATION TECHNOLOGY
ALTERNATIVES STUDY(CTAS)

PAGE 3

SUMMARY OF DATA USED FOR
ENERGY CONVERSION SYSTEM MATCHING
IN THE
LUMBER AND WOOD PRODUCTS
INDUSTRY

SIC. CODE	PROC. NO.	PROCESS DESCRIPTION	PROCESS POWER MWE	PROCESS POWER MBTU /HR	PROCESS HEAT TEMP MBTU /HR	PROCESS HEAT TEMP F PEAK	F AVG	POWER /HEAT RATIO	LOAD FACTOR HRS/YR	PRIMARY FUEL
2421	1	SOFTWOOD-LUM	1.500	5.123	30.	353.	353.	0.17	4000	0
2436	1	SOFT-PLYWOOD	3.000	10.245	75.	406.	406.	0.14	6000	0
2492	1	PARTICLE-BOA	5.000	17.075	37.	406.	406.	0.46	8000	NAT-GAS

Figure 12-3. Typical Summary Data by SIC Code

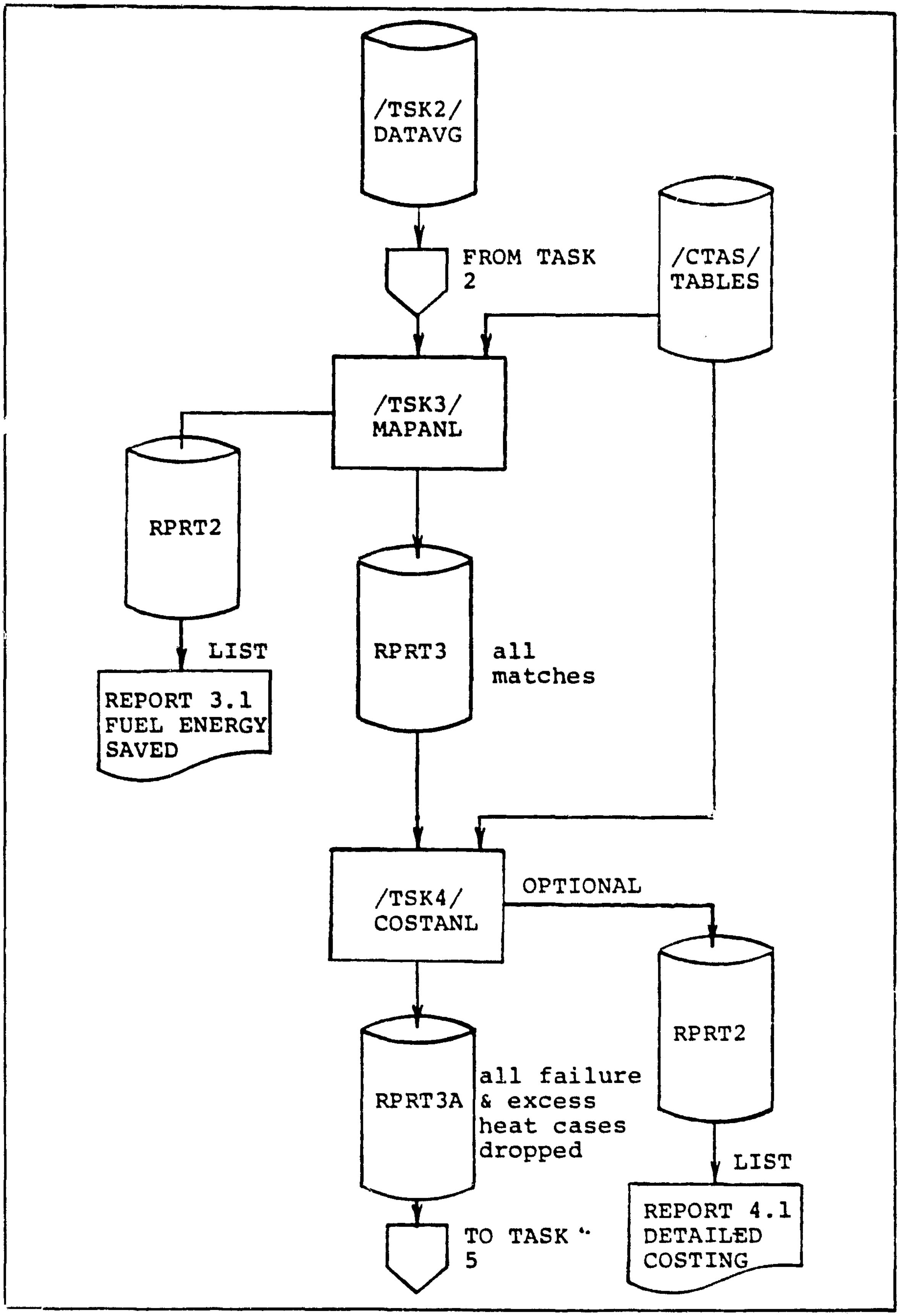

Figure 12-4. Fuel Saved and Capital Cost Data Handling - Process and Performance Matching and Capital Costing

Table 12-3

CONTENTS OF EXTRACT OF PROCESS DATA BASE FOR ECS MATCHING

SIC Code
Process Number
Process Description
Process Power Requirements
Process Heat Requirements
Operational Hours Per Year
Primary Fuel
By-Product Fuel Type and Quantity*
Hot Water Requirements*

* Added directly to programs later as needed.

ECONOMICS DATA BASE

The Economics Data Base is developed in three steps:

1. Fuel savings evaluation
2. Capital Cost estimating
3. Return on Investment (ROI) and Levelized Annual Energy Costs (LAEC) analysis

The computer system flow chart for steps 1 and 2 is shown in Figure 12-4.

Fuel Savings Analysis

The first step in establishing the economics data base is matching each process against each potential ECS-fuel combination (computer program MAPANL). (Each match of a process and ECS-fuel combination is called a case.)

Table 12-4

SELECTED INDUSTRY PROCESSES & SUMMAPY OF ENERGY REQUIREMENTS

SIC Code	Process No.	Description	Process Electric Power MWe	Process Electric Power MBtu/hr	Process Steam MBtu/hr	% Hot Water	Temperature °F Peak	Temperature °F Avg.	Power /Heat Ratio	Load Factor hrs/yr	Primary Fuel	By-Product or Waste Fuel Avail MBtu/hr
20 FOOD AND KINDRED PRODUCTS												
2011	1	Meat-Packing	1.940	6.625	24	40	250	250	0.28	2100	Gas	
2026	1	Fluid Milk	1.310	4.474	11	50	250	250	0.41	2100	Gas	
2046	1	Wet Corn Milling	28.500	97.327	659		250	250	0.15	6600	Gas	
2063	1	Beet Sugar Refining	4.700	16.050	301		250	250	0.05	2800	Gas	76.47
2082	1	Malt Beverage	6.040	20.627	86	60	250	250	0.24	6600	Gas	
22 TEXTILE MILL PRODUCTS												
2260	1	Textile Finishing	6.200	21.173	158		341	331	0.13	6240	Coal	
24 LUMBER AND WOOD PRODUCTS												
2421	1	Soft Wood-Lumber Sawmill	1.500	5.123	30		353	353	0.17	4000	Bark-Sawdust	41.2
2436	1	Soft Wood-Plywood/Veneer	3.000	10.245	75		406	406	0.14	6000	Bark	100.0
2492	1	Particle Board	5.000	17.075	37		406	406	0.46	8000	Natural Gas	41.2
26 PAPER & ALLIED PRODUCTS												
2621	2	Bleached Kraft	50.000	170.750	780		366	340	0.22	8400	Coal	353
2621	4	Unbleached Kraft	29.000	99.035	610		366	328	0.16	8400	Coal	259
2621	6	Neutral Sulfide Semichemical	20.000	68.300	307		366	345	0.22	8400	Coal	
2621	7	Thermo-Mechanical Pulping	31.300	106.889	183		366	355	0.58	8400	Coal	
2621	8	Waste Paper	15.000	51.225	224		366	355	0.21	8400	Coal	
28 CHEMICAL & ALLIED PRODUCTS												
2800	1	Small Integrated Power Plant	32.500	110.923	1100			366	0.101	8760		
2800	2	Medium Integrated Power Plant	77.200	263.484	1054			366	0.25	8760		
2800	3	Large Integrated Power Plant	97.200	331.744	947			366	0.35	8760		
2812	1	Chlorine - Caustic Sods	120.000	409.800	265		338	311	1.55	8500	Any	
2813	1	Cryogenic Oxygen	34.000	116.110	0		0	0	999.99	8400	Electric	
2819	1	Alumina	30.290	103.440	980		495	434	0.11	8136	Coal-Oil	
2821	2	Vinyl Chloride	4.000	13.660	207		422	373	0.07	8300	Gas	
2821	3	Low Density Polyethylene Resin	55.000	187.825	16		448	448	11.74	7900	Any	

Table 12-4 (Cont'd)

SELECTED INDUSTRY PROCESSES & SUMMARY OF ENERGY REQUIREMENTS

SIC Code	Process No.	Description	Process Electric Power MW_e	Process Electric Power MBtu/hr	Process Steam MBtu/hr	% Hot Water	Temperature °F Peak	Temperature °F Avg.	Power /Heat Ratio	Load Factor hrs/yr	Primary Fuel	By-Product or Waste Fuel Avail MBtu/hr
28 CHEMICAL & ALLIED PRODUCTS (Cont'd)												
2822	1	Styrene-Butadiene Rubber	7.500	25.612	35		338	338	0.73	7900	Any	
2824	1	Polyester Fibre	32.000	109.280	30		406	406	3.64	7900	Gas-Oil	
2824	2	Nylon Fibre	11.000	37.565	23		274	274	1.63	8760	Any	
2865	2	Cumene-Benzene	0.600	2.049	0		0	0	999.99	8400	Gas-Oil	
2865	3	Phenol/Acetone	6.000	20.490	300		489	398	0.07	8200	Any	
2865	4	Ethylbenzene	0.700	2.390	220		489	489	0.01	7900	Oil-Gas	
2869	1	Methanol Synthesis	1.500	5.123	133		574	538	0.04	7880	Feedstock	352.9
2869	4	Ethanol	3.300	11.270	400		460	460	0.03	7900	Gas-Oil	70.6
2873	1	Ammonia Synthesis	3.500	11.952	640		598	598	0.02	8400	Gas-Oil	
2874	1	Phosphoric Acid	4.000	13.660	92		353	292	0.15	7900	Gas-Oil	
2895	1	Carbon Black	4.000	13.660	20		298	298	0.68	7900	Oil-Gas	
29 PETROLEUM REFINING												
2911	1	Small Refinery	14.000	47.810	375		470	389	0.13	8760	Oil-Der	
2911	2	Medium Refinery	52.000	177.580	1333		470	395	0.13	8760	Oil-Der	
2911	3	Large Refinery	126.000	430.290	3042		470	385	0.14	8760	Oil	
32 STONE, CLAY AND GLASS												
3211	1	Flat-Glass	5.600	19.124	0		0	0	999.99	7500	Nat-Gas	
3221	1	Glass Containers	5.100	17.416	0		0	0	999.99	7500	Nat-Gas	
3229	1	Press-Blown Glass	1.100	3.756	0		0	0	999.99	7500	Nat-Gas	
3241	1	Cement	20.316	69.379	0		0	0	999.99	7920	Coal	
33 PRIMARY METALS												
3312	1	Specialty Steel	60.000	204.900	93		448	446	2.20	6700	Nat-Gas	
3325	1	Integrated Steel	280.000	956.200	912		448	445	1.05	8400	Cok-Coal	529.4
3325	4	Mini-Steel	40.000	136.600	91		448	446	1.50	6700	Nat-Gas	
3331	1	Copper-Fire Smelted	24.800	84.692	0		0	0	999.99	8400	Oil	
3331	4	CopperAnode Smelted	10.100	34.491	40		364	364	0.86	7620	Oil	
3334	1	Aluminum	756.000	2581.740	0		0	0	999.99	8760	Oil	

ECS Characteristics Table

The data for each ECS is described in Table 12-5 and reported in Figure 12-5. A glossary of the ECS abbreviations used on this figure and the computer output reports is shown in Table 12-6. Process temperatures that exceeded the highest allowable temperature for the ECS were deleted from the economic data base during capital costing. All cases where the power generated on-site was lower than the minimum size for the ECS were flagged but not deleted.

Report 5.1 - Fuel Savings Evaluation Program MAPANL. For every process a nocogeneration base case consisting of an on-site process boiler supplying all process heat and a utility supplying all process power is established. For each cogeneration case the ECS is matched to the process in two ways: a power match and a heat match. In the power match case, the ECS is required to generate all process power, completely replacing the utility. The heat generated by this match is then used to satisfy process heat requirements. If insufficient heat is generated by the ECS an auxiliary boiler is added to make up the deficiency. If excess heat is generated the match is flagged and deleted during capital costing.

In the heat match case, the ECS is required to supply all process heat. Power generated in this match replaces utility power. If excess power is generated, it is exported to the grid. (In this case a new equivalent nocogeneration case requires that the utility be evaluated as if it were generating as much power as the ECS in this heat match case (all process power plus all power exported).) If insufficient power is generated, the shortfall is purchased from the utility. The methodology for this matching is shown in Figure 12-6.

Almost 7200 cases were evaluated and for each case detailed fuel usage reports, entitled Report 5.1: Fuel Energy Saved by Process and ECS, were generated. A sample page from this report is shown in Fig. 12-7. The complete Report 5.1 is included in Volume VI, Part 1, and the results, since they are in Btu/hr, apply to both the coal-fired nocogeneration process boiler case as shown in Part 1, and the oil-fired nocogeneration base case as shown in

Table 12-5

CONTENTS OF ECS CHARACTERISTICS TABLE

ECS number

Short ECS Description

Long ECS Description

Minimum Size - MW (for information only)

Maximum Size - MW (for information only)

Expected Date of Commercialization (for information only)

Fuel Options

PTR	=	Petroleum based
Coal	=	Coal based
D	=	Distillate
R	=	Residual
F	=	Coal with flue gas desulfurization (FGD)
A	=	Coal with atmospheric fluidized bed (AFB)
P	=	Coal with pressurized fluidized bed (PFB)
X	=	Plain Coal

If a "Y" appears under these options it means that fuel can be used in that ECS. An "N" means it cannot be used.

Heat Equation

The factors A_1, B_1, and C_1 in the table are used in the following equation to determine the fraction of fuel that is converted to heat:

$$A_1 + B_1 * (\text{Temperature}) + C_1 * (\text{Temperature})^2$$

Power Equation

The factors A_2, B_2, and C_2 are used in the following equation to determine the fraction of fuel that is converted to electric power:

$$A_2 + B_2 * (\text{Temperature}) + C_2 * (\text{Temperature})^2$$

Maximum and Minimum Temperatures for Application of this ECS

Date Revised.

ECS	ECS	SIZE MIN MW	SIZE MAX MW	DATE	FUEL PTR D	FUEL PTR R	FUEL COAL D	FUEL COAL R	FUEL COAL F	FUEL COAL A	FUEL COAL P	FUEL X	HEAT A1	HEAT B1 *10**-3	HEAT C1 *10**-6	POWER A2	POWER B2 *10**-3	POWER C2 *10**-6	TEMP MIN	TEMP MAX	DATE REVISED
1 STM141	STM-TURB-1465/10	7.5	100.0	1978	N	Y	N	Y	Y	Y	N	N	0.5159	0.5380	0.0500	0.3341	-0.5380	-0.0500	250	500	11-16-78
2 STM038	STM-TURB-865/025	5.0	50.0	1978	N	Y	N	Y	Y	Y	N	N	0.5469	0.5452	0.0600	0.3031	-0.5452	-0.0600	250	450	11-20-78
3 PFBSTM	PFB-STMTB-1465/1	13.0	600.0	1990	N	N	N	N	N	N	Y	N	0.4733	0.4645	0.	0.3833	-0.5051	0.	250	600	11-20-78
4 TISTMT	TI-STMTB-1465/10	12.0	300.0	1995	N	Y	N	Y	N	N	N	Y	0.4281	0.4310	0.0664	0.4149	-0.4310	-0.0664	250	500	11-20-78
5 TIHRSG	THERMIONIC-HRSG	3.0	100.0	1995	N	Y	N	Y	N	N	N	Y	0.7071	0.0004	-0.0456	0.1407	0.	0.	250	650	11-20-78
6 STIRL	STIRLING-1472F	0.5	2.0	1990	Y	Y	Y	Y	N	N	N	Y	0.4172	0.0891	0.2037	0.3077	-0.0660	-0.2358	228	500	11-16-78
7 HEGT85	HELIUM-GT-85-REG	50.0	300.0	1990	N	N	N	N	N	Y	N	N	0.4468	-0.2737	-1.7050	0.3210	0.	0.	250	400	01-04-79
8 HEGT60	HELIUM-GT-60-REG	50.0	300.0	1990	N	N	N	N	N	Y	N	N	0.4297	0.1910	-1.5600	0.2590	0.	0.	250	550	01-04-79
9 HEGT00	HELIUM-GT-00-REG	50.0	300.0	1990	N	N	N	N	N	Y	N	N	0.6044	-0.4000	0.2270	0.1760	0.	0.	250	600	01-04-79
10 FCMCCL	FUEL-CL-MOLTCARB	100.0	1000.0	1990	N	N	N	N	N	N	N	Y	0.4783	-0.0046	-0.0245	0.3040	0.	0.	250	650	11-16-78
11 FCSTCL	FUEL-CL-STMTB-CO	125.0	1250.0	1990	N	N	N	N	N	N	N	Y	0.2873	0.3150	0.	0.4918	-0.3150	0.	250	500	11-16-78
12 IGGTST	INT-GAS-GTST-12/	80.0	500.0	1990	N	N	N	N	N	N	N	Y	0.3100	0.3225	0.0300	0.4060	-0.3225	-0.0300	250	500	04-22-79
13 GTSOAR	GT-HRSG-10/1750R	10.0	60.0	1978	N	Y	N	Y	N	N	N	N	0.4941	-0.0820	-0.2989	0.2900	0.	0.	250	600	11-16-78
14 GTAC08	GT-HRSG-08/2200R	14.0	136.0	1985	N	Y	N	Y	N	N	N	N	0.4803	0.1564	-0.1715	0.2700	0.	0.	250	600	11-16-78
15 GTAC12	GT-HRSG-12/2200R	14.0	143.0	1985	N	Y	N	Y	N	N	N	N	0.5161	-0.2437	0.2783	0.3050	0.	0.	250	600	11-16-78
16 GTAC16	GT-HRSG-16/2200R	14.0	143.0	1990	N	Y	N	Y	N	N	N	N	0.5021	-0.2609	0.1929	0.3230	0.	0.	250	600	11-16-78
17 GTWC16	GT-HRSG-16/2600R	20.0	200.0	1990	N	Y	N	Y	N	N	N	N	0.3991	0.0209	-0.0155	0.3150	0.	0.	250	600	11-16-78
18 CC1626	GTST-16/2600/146	20.0	197.0	1990	N	Y	N	Y	N	N	N	N	0.2260	0.2355	0.0220	0.4616	-0.2355	-0.0220	250	450	11-16-78
19 CC1622	GTST-16/2200/865	26.0	165.0	1990	N	Y	N	Y	N	N	N	N	0.2504	0.2496	0.0275	0.4619	-0.2496	-0.0275	250	450	11-16-78
20 CC1222	GTST-12/2200/146	14.0	143.0	1985	N	Y	N	Y	N	N	N	N	0.2499	0.2604	0.0243	0.4665	-0.2604	-0.0243	250	450	11-16-78
21 CC0822	GTST-08/2200/146	14.0	136.0	1985	N	Y	N	Y	N	N	N	N	0.2957	0.3082	0.0288	0.4613	-0.3082	-0.0288	250	450	11-16-78
22 STIG15	STIG-15-16/2200F	22.0	220.0	1990	N	Y	N	Y	N	N	N	N	0.0130	0.	0.	0.3810	0.	0.	250	430	11-16-78
23 STIG10	STIG-10-16/2200F	19.0	190.0	1990	N	Y	N	Y	N	N	N	N	0.1325	0.	0.	0.3591	0.	0.	250	430	11-16-78
24 STIG15	STIG-15-16/2200F	19.0	190.0	1990	N	Y	N	Y	N	N	N	N	0.2100	0.	0.	0.3352	0.	0.	250	430	11-16-78
25 DEADV3	DIESEL-ADVANCED-	2.0	15.0	1990	N	Y	N	Y	N	N	N	N	0.3598	-0.4230	0.	0.3710	0.	0.	250	450	11-20-78
26 DEADV2	DIESEL-ADVANCED-	2.0	15.0	1990	N	Y	N	Y	N	N	N	N	0.2540	0.	0.	0.3710	0.	0.	228	249	11-16-78
27 DEADV1	DIESEL-ADVANCED-	2.0	15.0	1990	N	Y	N	Y	N	N	N	N	0.3910	0.	0.	0.3710	0.	0.	150	227	11-16-78
28 DEHTPM	ADV-DIESEL-HEAT-	2.0	15.0	1990	N	Y	N	Y	N	N	N	N	0.5092	-0.4036	0.5000	0.4012	-0.0197	-0.5000	228	500	11-16-78
29 DESOA3	DIESEL-SOA-3	0.3	10.0	1978	Y	Y	Y	Y	N	N	N	N	0.3250	-0.4230	0.	0.3610	0.	0.	250	450	11-16-78
30 DESOA2	DIESEL-SOA-2	0.3	10.0	1978	Y	Y	Y	Y	N	N	N	N	0.2200	0.	0.	0.3610	0.	0.	155	249	11-16-78
31 DESOA1	DIESEL-SOA-1	0.3	10.0	1978	Y	Y	Y	Y	N	N	N	N	0.4010	0.	0.	0.3610	0.	0.	100	154	11-16-78
32 GTSOAD	GT-HRSG-10/2000D	13.0	72.0	1978	Y	N	Y	N	N	N	N	N	0.5383	-0.3296	0.3167	0.2920	0.	0.	250	600	11-16-78
33 GTRA08	GT-85RE-08/2200D	13.0	130.0	1985	Y	N	Y	N	N	N	N	N	0.4038	0.0554	-0.6556	0.3570	0.	0.	250	600	11-16-78
34 GTRA12	GT-85RE-12/2200D	14.0	137.0	1985	Y	N	Y	N	N	N	N	N	0.4077	0.0097	-0.5019	0.3580	0.	0.	250	600	11-16-78
35 GTRA16	GT-85RE-16/2200D	14.0	138.0	1990	Y	N	Y	N	N	N	N	N	0.4251	-0.0315	-0.3823	0.3490	0.	0.	250	600	11-16-78
36 GTR208	GT-60RE-08/2200D	13.0	130.0	1985	Y	N	Y	N	N	N	N	N	0.4722	-0.1399	-0.1411	0.3200	0.	0.	250	600	11-16-78
37 GTR212	GT-60RE-12/2200D	14.0	138.0	1985	Y	N	Y	N	N	N	N	N	0.4475	-0.0998	-0.1818	0.3300	0.	0.	250	600	11-16-78
38 GTR216	GT-60RE-16/2200D	14.0	139.0	1990	Y	N	Y	N	N	N	N	N	0.4465	-0.0903	-0.2117	0.3370	0.	0.	250	600	11-16-78
39 GTRW08	GT-85RE-08/2600D	17.0	169.0	1990	Y	N	Y	N	N	N	N	N	0.3302	0.0246	-0.4617	0.3510	0.	0.	250	600	11-16-78
40 GTRW12	GT-85RE-12/2600D	19.0	188.0	1990	Y	N	Y	N	N	N	N	N	0.3330	-0.0106	-0.3406	0.3640	0.	0.	250	600	11-16-78
41 GTRW16	GT-85RE-16/2600D	19.0	190.0	1990	Y	N	Y	N	N	N	N	N	0.3503	-0.0560	-0.2182	0.3570	0.	0.	250	600	11-15-78
42 GTR308	GT-60RE-08/2600D	17.0	170.0	1990	Y	N	Y	N	N	N	N	N	0.4407	-0.3540	0.0124	0.3100	0.	0.	250	600	11-16-78
43 GTR312	GT-60RE-12/2600D	19.0	190.0	1990	Y	N	Y	N	N	N	N	N	0.3816	-0.1419	0.0133	0.3420	0.	0.	250	600	11-16-78
44 GTR316	GT-60RE-16/2600D	19.0	190.0	1990	Y	N	Y	N	N	N	N	N	0.3844	-0.1486	0.0278	0.3390	0.	0.	250	600	11-16-78
45 FCPADS	FUEL-CL-PHOSACID	1.0	10.0	1985	Y	N	Y	N	N	N	N	N	0.1700	0.	0.	0.3800	0.	0.	160	600	04-22-79
46 FCMCDS	FUEL-CL-MOLTCARB	4.4	25.0	1990	Y	N	Y	N	N	N	N	N	0.2330	0.	0.	0.4120	0.	0.	200	650	11-16-78

Figure 12-5. Energy Conversion System Characteristics

Table 12-6

GLOSSARY OF ABBREVIATIONS

ENERGY CONVERSION SYSTEMS (ECS) AND FUELS

ECS - Fuel Abbreviation	ECS TYPE & DESCRIPTION	FUEL & UTILIZATION SYSTEM	ECS Performance Characteristics Number	STATUS (State of Art or Advanced)
STM141-Coal F	Steam Turbine Throttle P=1465 psia; T=1000°F	Coal-Flue Gas Desulfurization	1	SOA
STM141-Coal A	" " " " " "	Coal-Atmospheric Fluidized Bed	1	ADV
STM141-Residual	" " " " " "	Residual-Petroleum or Coal Derived	1	SOA
STM088-Coal F	" " " P=865 psia; T=825°F	Coal-Flue Gas Desulfurization	2	SOA
STM088-Coal A	" " " " " "	Coal-Atmospheric Fluidized Bed	2	ADV
STM088-Residual	" " " " " "	Residual-Petroleum or Coal Derived	2	SOA
PFBSTM	PFB Steam Turbine Gas Turbine T=1000°F Steam Turbine P=1465 psia, T=1000°F	Coal-Pressurized Fluidized Bed	3	ADV
TISTMT-Coal F	Thermionic-Steam Turbine " " " " "	Coal-Flue Gas Desulfurization	4	ADV
TISTMT-Residual	" " " " " " " "	Residual-Petroleum or Coal Derived	4	ADV
TIHRSG-Coal F	Thermionic and HRSG(1)	Coal-Flue Gas Desulfurization	5	ADV
TIHRSG-Residual	" " "	Residual-Petroleum or Coal Derived	5	ADV
STIRL-Coal	Stirling Engine Helium @ T=1472°F	Coal-Flue Gas Desulfurization	6	ADV
STIRL-Residual	" " " "	Residual-Petroleum or Coal Derived	6	ADV
STIRL-Distillate	" " " "	Distillate- " " "	6	ADV
HEGT85-Coal A	Closed Cycle Gas Turbine Helium @ T=1500°F; Regen. Eff.=85%	Coal-Atmospheric Fluidized Bed	7	ADV
HEGT60-Coal A	" " " " " " " " =60%	" " " "	8	ADV
HEGT0-Coal A	" " " " " " " " = 0%	" " " "	9	ADV
FCMCCL-Coal	Fuel Cell, Molten Carbonate, HRSG	Coal-Integrated Gasifier	10	ADV
FCSTCL-Coal	" " " " , Steam Turbine P=1465 psia; T=1000°F	" "	11	ADV
FCMCDS-Distillate	" " " " , HRSG	Distillate-Petroleum & Coal Derived	46	ADV
FCPADS-Distillate	" " , Phosphoric Acid, HRSG	" " " "	45	ADV
GTSOAR-Residual	Gas Turbine AC(2) with HRSG, P/P=10, T=1750°F	Residual - " " "	13	SOA
GTSOAD-Distillate	" " " " " " =2000°F	Distillate- " " "	32	SOA
GTAC08-Residual(4)	" " " " " , P/P=8, T=2200°F	Residual - " " "	14	ADV
GTAC12-Residual	" " " " " , P/P=12, T=2200°F	" " " "	15	ADV
GTAC16-Residual	" " " " " , P/P=16, T=2200°F	" " " "	16	ADV
GTWC16-Residual	" " WC(3) " " T=2600°F	" " " "	17	ADV
CC1622-Residual	Combined Cycle, AC, P/P=16, T=2200; STM TURB P=865, T=825°F	" " " "	19	ADV
CC1222-Residual	" " " P/P=12, " " " P=1465, T=1000°F	" " " "	20	ADV
CC0822-Residual	" " " P/P=8, " " " " "	" " " "	21	ADV
CC1626-Residual	" " , WC, P/P=16, T=2600; " " " "	" " " "	18	ADV
IG GT ST-Coal	" " , AC, P/P=12, T=2100; " " " "	Coal, Integrated Gasifier	12	ADV
STIG15-Residual	Steam Injected Gas Turbine, AC, HRSG, P/P=16, T=2200, 15% Super. Steam	Residual-Petroleum or Coal Derived	22	ADV
STIG10-Residual	" " " " " " " " , 10% " "	" " " "	23	ADV
STIGS-Residual	" " " " " " " " , 10% Sat.	" " " "	24	ADV
GTRA08-Distillate	Gas Turbine, AC, w/HRSG, Reg. Eff.=85%, P/P=8, T=2200°F	Distillate, " " "	33	ADV
GTRA12-Distillate	" " " " " " " , P/P=12, "	" " " "	34	ADV
GTRA16-Distillate	" " " " " " " , P/P=16, "	" " " "	35	ADV
GTR208-Distillate	" " " " " " =60%, P/P=8, "	" " " "	36	ADV
GTR212-Distillate	" " " " " " " , P/P=12, "	" " " "	37	ADV
GTR216-Distillate	" " " " " " " , P/P=16, "	" " " "	38	ADV
GTRW08-Distillate	" " , WC, " " " =85%, P/P=8 ,T=2600°F	" " " "	39	ADV
GTRW12-Distillate	" " " " " " " , P/P=12, "	" " " "	40	ADV
GTRW16-Distillate	" " " " " " " , P/P=16, "	" " " "	41	ADV
GTR308-Distillate	" " " " " " =60%, P/P=8 , "	" " " "	42	ADV
GTR312-3-Distillate	" " " " " " " , P/P=12, "	" " " "	43	ADV
GTR316-3-Distillate	" " " " " " " , P/P=16, "	" " " "	44	ADV
DESOA1-3-Distillate	Medium Speed Diesel with 175°F Jacket Water	" " " "	29-31	SOA
DESOA 1-3-Residual	" " " " " " "	Residual, " " "	29-31	SOA
DESADV1-3-Residual	" " " " 250°F " "	" " " "	25-27	ADV
DEHTPM-Residual	" " " " " " " w/Vapor Compression Heat Pump	" " " "	28	ADV

(1) HRSG - Heat Recovery Steam Generator
(2) AC - Air Cooled
(3) WC - Water Cooled
(4) Detailed analysis of the effect of cycle variations on simple, steam injected and regenerative gas turbines and combined cycles are shown in Volume VI - Computer Data.

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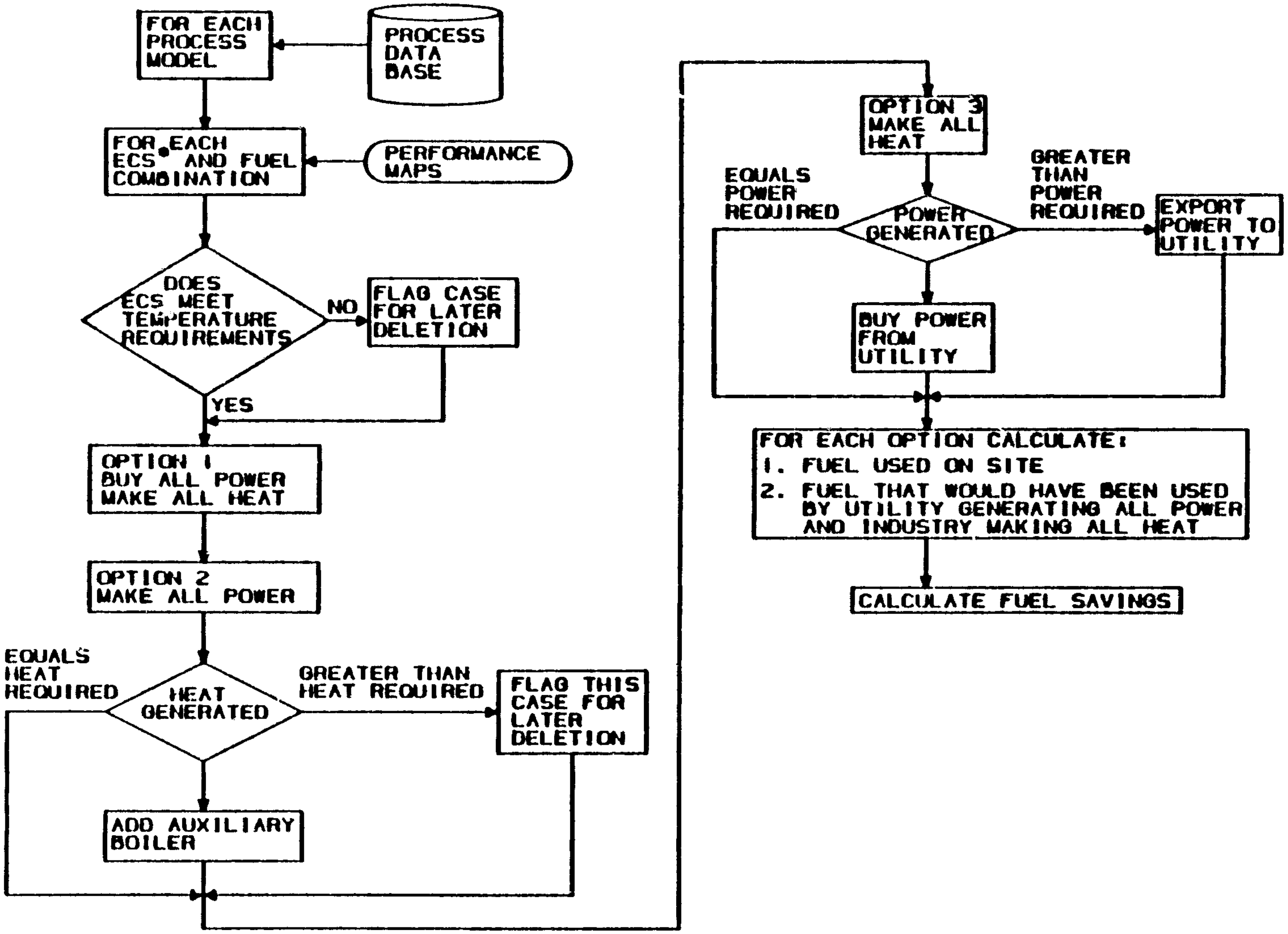

• ECS=ENERGY CONVERSION SYSTEM

Figure 12-6. CTAS Matching of Process Model to Energy Conversion Systems Performance Maps

DATE 04/22/79	GENERAL ELECTRIC COMPANY	PAGE 17
I SE PEO ADV DESIGN ENGR	COGENERATION TECHNOLOGY ALTERNATIVES STUDY REPORT 6.1 **FUEL ENERGY SAVED BY PROCESS AND ECS**	

INDUSTRY 20461 MW 28.50 PROCESS MILLIONS BTU/HR 659.0 PROCESS TEMP(F) 250. PRODUCT WET-CORN-MIL HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL — WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 OHOCON N O C O G E N	0.	0.	0.	0.	0.	0.	775.	304.	775.	COAL-FGD	1079.	0	0.	0.09	0.61
1 STM141 STM-TURB-1 POWR	0.	189.	495.	323.	97.	28.	395.	0.	890.	RESIDUAL	890.	0	0.18	0.11	0.74
1 STM141 STM-TURB-1 HEAT	0.	386.	[illegible]	659.	198.	58.	0.	-316.	1008.	RESIDUAL	693.	0	0.28	0.20	0.65
1 STM141 STM-TURB-1 POWR	0.	189.	495.	323.	97.	29.	395.	0.	890.	COAL-FGD	890.	0	0.18	0.11	0.74
1 STM141 STM-TURB-1 HEAT	0.	386.	1008.	659.	198.	58.	0.	-316.	1008.	COAL-FGD	693.	0	0.28	0.20	0.65
1 STM141 STM-TURB-1 POWR	0.	189.	495.	323.	97.	29.	395.	0.	890.	COAL-AFB	890.	0	0.18	0.11	0.74
1 STM141 STM-TURB-1 HEAT	0.	386.	1008.	659.	198.	58.	0.	-316.	1008.	COAL-AFB	693.	0	0.28	0.20	0.65
2 STM088 STM-TURB-8 POWR	0.	189.	596.	410.	97.	29.	293.	0.	890.	RESIDUAL	890.	0	0.18	0.11	0.74
2 STM088 STM-TURB-8 HEAT	0.	305.	959.	659.	166.	48.	0.	-185.	959.	RESIDUAL	774.	0	0.24	0.16	0.69
2 STM088 STM-TURB-8 POWR	0.	189.	596.	410.	97.	29.	293.	0.	890.	COAL-FGD	890.	0	0.18	0.11	0.74
2 STM088 STM-TURB-8 HEAT	0.	305.	959.	659.	166.	48.	0.	-185.	959.	COAL-FGD	774.	0	0.24	0.16	0.69
2 STM088 STM-TURB-8 POWR	0.	189.	596.	410.	97.	29.	293.	0.	890.	COAL-AFB	890.	0	0.18	0.11	0.74
2 STM088 STM-TURB-8 HEAT	0.	305.	959.	659.	166.	48.	0.	-185.	959.	COAL-AFB	774.	0	0.24	0.16	0.69
3 PFBSTM PFB-STMTB- POWR	0.	188.	378.	223.	97.	29.	513.	0.	891.	COAL-PFB	891.	0	0.17	0.11	0.74
3 PFBSTM PFB-STMTB- HEAT	0.	555.	1118.	659.	287.	84.	0.	-594.	1118.	COAL-PFB	524.	0	0.33	0.26	0.59
4 TISTMT TI-STMTB-1 POWR	0.	187.	321.	173.	97.	28.	571.	0.	892.	RESIDUAL	892.	0	0.17	0.11	0.74
4 TISTMT TI-STMTB-1 HEAT	0.	710.	1220.	659.	370.	108.	0.	-852.	1220.	RESIDUAL	369.	0	0.37	0.30	0.54
4 TISTMT TI-STMTB-1 POWR	0.	187.	321.	173.	97.	28.	571.	0.	892.	COAL	892.	0	0.17	0.11	0.74
4 TISTMT TI-STMTB-1 HEAT	0.	710.	1220.	659.	370.	108.	0.	-852.	1220.	COAL	369.	0	0.37	0.30	0.54
5 TIHRSG THERMIONIC POWR	0.	164.	691.	469.	97.	29.	224.	0.	915.	RESIDUAL	915.	0	0.15	0.11	0.72
5 TIHRSG THERMIONIC HEAT	0.	231.	971.	659.	137.	40.	0.	-123.	971.	RESIDUAL	848.	0	0.19	0.14	0.68
5 TIHRSG THERMIONIC POWR	0.	164.	691.	469.	97.	29.	224.	0.	915.	COAL	915.	0	0.15	0.11	0.72
5 TIHRSG THERMIONIC HEAT	0.	231.	971.	659.	137.	40.	0.	-123.	971.	COAL	848.	0	0.19	0.14	0.68
6 STIRL STIRLING-1 POWR	0.	139.	352.	159.	97.	29.	588.	0.	940.	DISTILLA	940.	0	0.13	0.10	0.70
6 STIRL STIRLING-1 HEAT	0.	577.	1457.	659.	403.	118.	0.	-955.	1457.	DISTILLA	502.	0	0.28	0.28	0.45
6 STIRL STIRLING-1 POWR	0.	139.	352.	159.	97.	29.	588.	0.	940.	RESIDUAL	940.	0	0.13	0.10	0.70
6 STIRL STIRLING-1 HEAT	0.	577.	1457.	659.	403.	118.	0.	-955.	1457.	RESIDUAL	502.	0	0.28	0.28	0.45
6 STIRL STIRLING-1 POWR	0.	139.	352.	159.	97.	29.	588.	0.	940.	COAL	940.	0	0.13	0.10	0.70
6 STIRL STIRLING-1 HEAT	0.	577.	1457.	659.	403.	118.	0.	-955.	1457.	COAL	502.	0	0.28	0.28	0.45

Figure 12-7. Fuel Energy Saved Report

Part 2. This report is organized by industrial process; e.g., industry 20461, a wet corn milling process, and then data for each ECS-fuel combination and both power and heat matches. The first line listed in each process is for the nocogeneration matched to the process.

The Report 5.1 heading on each page gives data on the industrial process being matched including waste fuel which is available to the ECS from the process. The column headed "Waste Fuel Used" shows the actual amount of fuel used in the ECS. "AUX PROCESS BOILER" is the process or auxiliary boiler fuel. All of the fuel columns except "Waste Fuel Use" give the combined total of fossil and waste fuel. The fuel energy saved ratio, "FESR", which is equal to total nocogeneration fuel minus cogeneration fuel all divided by the total cogeneration fuel shown in the "NET = TOTAL + UTILITY" column. In a heat match case where excess power is exported to the utility (indicated by a negative value for "UTILITY FUEL USED") the absolute value of this displaced utility fuel must be added to both nocogeneration and cogeneration "NET = TOTAL + UTILITY" fuel values in calculating the FESR. The values given in the columns labelled "POWER FACTOR" and "HEAT FACTOR" did not prove useful in the study. A 1 in the fail column indicates that the ECS cannot supply heat at the required temperature and a 10 indicates that the ECS is outside the size range for which the cost data is considered accurate.

Report 5.3 - Capital Cost Estimating

The second step in establishing the economic data base is capital cost estimating for each case that was not previously flagged for having exceeded the temperature limits of the ECS or for having excess heat generated.

Component Cost Table. The Component Cost Table, Figure 12-8, contains all major components used in each ECS. A component may be part of many different ECS's, but it occurs only once on this table. This provides a consistent estimate for that component independent of ECS application. The component cost table is described in Table 12-7. A list of the components making up each on-site nocogeneration or cogeneration system

Island	Major Comp.	Comp.	Component Name	Units of Meas.	Size Min.	Size Max.	Component 10^3\$ Min.	Component 10^3\$ Max.	Fraction Material Min.	Fraction Material Max.	Fraction Labor Min.	Fraction Labor Max.
2	21	1	150PSI-OIL BOILER FE	1.00	11[illegible].00	[illegible].00						
2	21	2	895PSI OIL BOILER FE	1.00	[illegible].00	1100.00						
2	21	3	1525PSI-OIL BOILER-F	1.00	[illegible].00	1100.00						
2	21	4	150PSI-OIL BOILER FF	1.00	50.00	300.00						
2	21	5	895PSI-OIL BOILER FF	1.00	100.00	400.00	DATA OMITTED BECAUSE OF PROPRIETARY NATURE					
2	21	6	1525PSI-OIL-BOILR-FF	1.00	125.00	450.00						
2	22	7	150PSI-COAL BOILER-F	1.00	227.00	[illegible].00						
2	22	8	875PSI-COAL-BOILER F	1.00	276.00	800.00						
2	22	9	1525PSIG-COAL BOILER	1.00	233.00	300.00						
1	2	10	COAL-HNDL	1.00	240.00	3600.00						
1	1	11	OIL-HNDL	1.00	50.00	3000.00						
2	23	12	AFB-HEGT85	2.00	50.00	300.00	17.[illegible]	[illegible].30	0.41	0.42	[illegible]	[illegible]
2	23	13	AFB-HEGT00	2.00	50.00	300.00	21.40	74.[illegible]	0.39	0.33	[illegible]	[illegible]
2	23	14	AFB-HEGT60	2.00	50.00	300.00	1[illegible].70	63.90	0.42	0.40	[illegible]	[illegible]
2	25	15	GASIFIER-MCFC	1.00	1122.00	11220.00	[illegible]	64.31	0.71	0.71	[illegible]	[illegible]
2	25	16	SMALL-TEXACO-GASIFIE	1.00	510.00	2039.00	5.47	20.43	0.70	0.70	0.15	[illegible]
2	25	17	LARGE-TEXACO-GASIFIE	1.00	2040.00	10196.00	20.43	[illegible]	0.70	0.70	[illegible]	[illegible]
2	23	18	REFORMER-DIST-OIL	1.00	9.00	[illegible]	0.15	1.16	0.10	0.10	0.15	0.15
3	31	26	GT-STM-INJECTED	2.00	20.00	100.00	3.50	13.00	0.11	0.08	0.03	0.04
3	30	31	STM-TURB-850PSI	2.00	5.00	100.00						
3	30	32	STM-TURB-1450	2.00	7.50	100.00			PPOPRIETARY			
2	24	33	PFB-SMALL BOILER	1.00	984.00	1968.00	16.20	26.30	0.19	0.17	0.14	0.14
2	24	34	PFB-LARGE-BOILER	1.00	1968.00	7870.00	26.30	105.00	0.19	0.17	0.14	0.14
4	43	35	EXPANSION-TG-SMALL	2.00	26.00	52.00						
4	43	36	EXPANSION-TG-LARGE	2.00	52.00	207.00						
1	3	37	LIMESTONE-SMALL	1.00	985.00	1969.00						
1	3	38	LIMESTONE-LARGE	1.00	1969.00	7870.00						
3	31	39	STIG-WATER-COND	5.00	100.00	1000.00						
4	40	40	HRSG-800F-158	1.00	60.00	235.00						
4	40	41	HRSG-800F-420	1.00	57.00	200.00						
4	40	42	HRSG-1000F-158	1.00	90.00	350.00						
4	40	43	HRSG-1000F-420	1.00	86.00	331.00						
4	40	44	HRSG-1000F-630	1.00	83.00	319.00						
4	40	45	HRSG-1000F-895	1.00	79.00	304.00	DATA OMITTED BECAUSE OF PROPRIETARY NATURE					
4	40	46	HRSG-1200F-158	1.00	115.00	460.00						
4	40	47	HRSG-1200F-420	1.00	114.00	450.00						
4	40	48	HRSG-1200F-630	1.00	118.00	443.00						
4	40	49	HRSG-1200F-895	1.00	109.00	438.00						
4	40	50	HRSG-1200F-1525	1.00	120.00	423.00						
4	40	51	HRSG-1400F-158	1.00	150.00	600.00						
4	40	52	HRSG-1400-420	1.00	143.00	537.00						
4	40	53	HRSG-1400F-630	1.00	148.00	579.00						
4	40	54	HRSG-1400F-895	1.00	146.00	577.00						
4	40	55	HRSG-1400F-1525	1.00	139.00	569.00						
5	51	56	PUMPS-CIRC-WATER	1.00	10.00	8000.00						
5	52	57	SURFACE-CONDENSERS	1.00	10.00	8000.00						
5	53	58	VAPOR-CONDENSERS	1.00	0.50	38.80						
5	50	59	COOLING-TOWERS	4.00	5.00	130.00						
3	31	60	GAS-TURB-HEGT85	2.00	50.00	300.00	12.50	46.90	0.41	0.40	[illegible]	0.31
3	31	61	GAS-TURB-HEGT00	2.00	50.00	300.00	9.56	36.70	0.39	0.32	0.30	[illegible]
3	31	62	GAS-TURB-HEGT60	2.00	50.00	300.00	9.25	35.60	0.42	0.40	[illegible]	0.31

Figure 12-8. CTAS Capital Cost of ECS Components

Island	Major Comp.	Comp.	Component Name	Units of Meas.	Size Min.	Size Max.	Component 10^3 \$ Min.	Component 10^3 \$ Max.	Fraction Material Min.	Fraction Material Max.	Fraction Labor Min.	Fraction Labor Max.
3	31	66	GAS-TURB-CC-OXT	2.00	31.50	94.50	4.40	11.21	0.11	0.03	0.10	0.06
3	31	67	GAS-TURB-CC-30XT	2.00	28.70	86.20	4.23	10.77	0.11	0.03	0.10	0.06
3	32	68	DIESEL-DIST	2.00	0.30	1.00	0.11	0.35	0.19	0.19	0.19	0.19
3	32	69	DIESEL-ADV-SMALL	2.00	1.00	15.00	0.97	5.06	0.12	0.09	0.12	0.09
3	32	70	DIESEL-ADV-LARGE	2.00	15.00	30.00	5.06	10.12	0.09	0.09	0.09	0.09
7	70	71	HX-STEAM-WATER	1.00	78.50	8000.00	0.04	3.65	0.65	0.55	0.65	0.55
7	70	72	HX-THERMIONIC	1.00	960.40	3357.00	0.83	6.94	0.50	0.40	0.50	0.40
3	32	73	HEATPUMP-ADV-DIESEL	2.00	0.01	3.00	0.01	0.30	0.12	0.12	0.11	0.11
2	23	74	AFB-1465-1000F									
2	23	75	AFB-865-825F	DATA OMITTED BECAUSE OF PROPRIETARY NATURE								
2	23	76	AFB-PROCESS-STEAM									
3	33	77	THERMIONIC-COAL-SMAL	1.00	200.00	1228.00	6.54	33.42	1.69	1.18	1.53	1.07
3	33	78	THERMIONIC-COAL-LRG	1.00	1228.00	2456.00	33.42	66.84	1.18	0.76	1.07	0.37
8	80	80	MASTER-CONTROL-SYSTE	2.00	5.00	500.00	0.08	1.50	0.15	0.15	0.25	0.25
8	81	81	ELECTRIC-PLANT	2.00	5.00	500.00	0.	0.	0.03	2.00	0.03	2.90
8	82	82	PIPING-DUCTING-WIRIN	2.00	5.00	500.00	0.	0.	0.06	3.75	0.04	3.75
8	83	83	STRUCTURES-MISC	2.00	5.00	500.00	0.	0.	0.07	3.75	0.05	3.75
8	84	84	POWER-PLANT-STRUCTUR	2.00	5.00	500.00	0.	0.	0.08	4.00	0.07	2.50
5	50	89	COOL-TOWERS-HELIUM-A	2.00	50.00	300.00	0.36	3.00	0.15	0.10	0.50	0.40
2	29	90	STIRLING-SMALL-RESID	1.00	6.17	24.68	0.01	0.03	0.19	0.12	0.19	0.12
2	29	91	STIRLING-LARGE-RESID	1.00	24.68	49.36	0.03	0.06	0.12	0.12	0.12	0.12
2	29	92	STIRLING-SMALL-DIST	1.00	6.17	24.68	0.01	0.03	0.19	0.12	0.19	0.12
2	29	93	STIRLING-LARGE-DIST	1.00	24.68	49.36	0.03	0.06	0.12	0.12	0.12	0.12
2	29	94	STIRLING-COAL-SMALL	1.00	6.17	24.68	0.34	0.87	0.15	0.12	0.26	[illegible]
2	29	95	STIRLING-COAL-LARGE	1.00	24.68	100.00	0.87	2.25	0.12	0.09	0.20	0.16
2	29	96	STIRLING-GEN-SMALL	1.00	6.17	24.68	0.15	0.56	0.19	0.12	0.19	0.12
2	29	97	STIRLING-GEN-LARGE	1.00	24.68	49.36	0.56	1.12	0.12	0.12	0.12	0.12
3	35	98	MOLTEN-CARBON-TCG	2.00	100.00	1000.00	17.30	114.80	0.30	0.30	0.16	0.16
3	35	99	MOLTEN-CARBON-FCMCDS	2.00	4.41	25.00	0.87	4.63	0.10	0.10	0.15	0.15
3	36	100	PHOSPH-ACID-FC	1.00	9.00	90.00	0.16	1.91	0.10	0.10	0.15	0.15
3	31	101	GTSOAR	2.00	10.00	100.00	2.28	14.75	0.14	0.10	0.03	0.07
3	31	102	GTSOAD	2.00	12.00	120.00	1.88	13.10	0.14	0.10	0.03	0.06
3	31	103	GTAC08	2.00	13.00	130.00	2.25	15.50	0.14	0.10	0.03	0.06
3	31	104	GTAC12	2.00	13.60	136.00	2.45	18.00	0.14	0.10	0.03	0.07
3	31	105	GTAC16	2.00	13.60	136.00	2.70	19.70	0.14	0.10	0.03	0.06
3	31	106	GTWC16	2.00	18.20	182.00	3.50	20.70	0.14	0.10	0.03	0.06
3	31	107	GTRA08	2.00	12.30	123.00	2.86	18.70	0.14	0.10	0.03	0.07
3	31	108	GTRA12	2.00	13.00	130.00	3.10	20.50	0.14	0.10	0.03	0.06
3	31	109	GTRA16	2.00	13.20	132.00	3.40	22.30	0.14	0.10	0.03	0.06
3	31	110	GTRW08	2.00	15.60	156.00	3.55	20.00	0.14	0.10	0.03	0.07
3	31	111	GTRW12	2.00	17.40	174.00	3.85	21.70	0.14	0.10	0.03	0.06
3	31	112	GTRW16	2.00	17.50	175.00	4.10	23.00	0.14	0.10	0.03	0.06
3	31	113	GTR208	2.00	12.40	124.00	2.60	17.50	0.14	0.10	0.03	0.07
3	31	114	GTR212	2.00	13.10	131.00	2.90	19.20	0.14	0.10	0.03	0.07
3	31	115	GTR216	2.00	13.20	131.00	3.10	21.00	0.14	0.10	0.03	0.06
3	31	116	GTR308	2.00	15.80	158.00	3.25	19.10	0.14	0.10	0.03	0.06
3	31	117	GTR312	2.00	17.50	175.00	3.50	20.60	0.14	0.10	0.03	0.07
3	31	118	GTR316	2.00	17.70	177.00	3.80	22.00	0.14	0.10	0.03	0.07
3	33	119	THERMIONIC-OIL-SMALL	1.00	200.00	1228.00	5.67	30.30	1.41	0.94	[illegible]	0.91
3	33	120	THERMIONIC-OIL-LARGE	1.00	1228.00	2456.00	30.30	60.60	0.94	0.76	0.91	0.74

Figure 12-8 (Cont'd). CTAS Capital Cost of ECS Components

Table 12-7

CONTENTS OF COMPONENT COST TABLE

Island Number:	Groups components into specific costing areas.
Component Number:	Unique number assigned to this component.
Component Name:	For information only.
Unit of Measure:	Determines basis for cost function. 1 = millions Btu/hr 2 = Megawatts. (This code is an indicator and for special components may be overridden in COSTANL.)
Minimum & Maximum Size:	In the same units as the unit of measure. When the maximum size is exceeded, multiple units are used. When unit is below minimum, no special actions are taken.
Component Cost:	Cost of major component (a function of size).
Material Cost:	Cost of installation material as a fraction of component cost (a function of size).
Labor Cost:	Cost of installed labor as a fraction of component cost (a function of size).

ECS-fuel type is contained in Component Logic Table included in the computer program. When a component is to be costed and its size has been determined in terms of Units of Measure, its cost as an exponential function of size is calculated from the data in Figure 12-8 Component Cost Table. For example, if the component list called for a "COMP" 101, a residual-fired state-of-the-art gas turbine, "GTSOAR" and the matching routine called for a size of 50 MW, the component equipment cost is:

$$C = C_{MAX}\left(\frac{S}{S_{MAX}}\right)^{X}$$

where

$$X = \frac{\log\left(\frac{C_{MAX}}{C_{MIN}}\right)}{\log\left(\frac{S_{MAX}}{S_{MIN}}\right)} = \frac{\log\left(\frac{14.75}{2.28}\right)}{\log\left(\frac{100}{0}\right)} = 0.811$$

C_{MIN} = component cost for min size = $\$2.28 \times 10^6$

C_{MAX} = component cost for max size = $\$14.75 \times 10^6$

S_{MIN} = min size = 10 MW

S_{MAX} = max size = 100 MW

S = size to be costed = 50 MW

C = component equipment cost = $14.75 \times 10^6 \left(\frac{50}{100}\right)^{.811} = \$8.41 \times 10^6$

or $168/kW

The fraction, fm, of the equipment cost that is installation material cost is also assumed to vary exponentially with size and in the above example is:

$$f_M = .10\left(\frac{50}{100}\right)^{-.146} = 0.111$$

where

$$X = \frac{\log\left(\frac{.14}{10}\right)}{\log\left(\frac{10}{100}\right)} = -0.146$$

and the installation material cost = $.111 \times 8.41 \times 10^6 = \$0.931 \times 10^6$. In a similar fashion, the fraction, f_L, of the equipment cost that is installation labor is:

$$f_L = .06\left(\frac{50}{100}\right)^{-.125} = 0.065$$

where

$$X = \frac{\log\left(\frac{.08}{.06}\right)}{\log\left(\frac{10}{100}\right)} = -0.125$$

and the installation direct labor cost = $.065 \times 8.41 \times 10^6 = \$0.550 \times 10^6$. The indirect labor field cost is 0.9 times the installation direct labor or $0.9 \times .550 \times 10^6 = \$0.495 \times 10^6$.

Cost Analysis Program - COSTANL. The Component Cost Table and Component Logic Tables are used in program COSTANL to update the economic data base with the total installed capital cost. A sample page from a Report 5.3 cost report generated in this program is shown in Figure 12-9.

For each case the Component Logic Table is interrogated and each component specified is sized and costed as shown above. Requirements that exceed the component maximum size result in multiple units of that component. The special logic indicators direct the program to specific equations for sizing components, such as heat recovery steam generators and prime movers. Fuel handling systems and boilers are selected, as required, to be compatible with the fuel used on-site. Indirect costs are added to the total direct costs to give the total installed cost.

Report 5.3: Capital Costs by Island for Selected Process-ECS Matches is contained in Volume VI, Part 1. Table 12-8 shows the cogeneration ECS-process matches which were selected as representative by NASA and GE and included in the report. At the beginning of each process matched, a nocogeneration coal-fired process boiler capital cost by island breakdown is included. The capital costs of all matched systems was calculated but only the total costs are shown in Reports 5.2 and 5.4 with the coal-fired nocogeneration matches in Volume VI, Part 1, and for oil-fired nocogeneration in Part 2.

Report 5.4 - Return on Investment (ROI) and Levelized Annual Energy Costs (LAEC) Analysis

The third and last step in developing the economic data base is the calculation of the percentage Return On Investment (ROI) and Levelized Annual Energy Costs (LAEC). The computer system flow chart for step 3 is shown in Figure 12-10. These calculations use data already in the economics data base, such as the capital costs and the on-site fuel use, power generation, power requirements and auxiliary boiler requirements.

Economic groundrules used in this calculation are shown in Table 12-9.

GENERAL ELECTRIC COMPANY

DATE 03/31/79
I SE-PEO ADV. DES. ENGRG.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.3
CAPITAL COSTS BY ISLAND FOR SELECTED PROCESS-ECS MATCHES

PROCESS 20111

ECS DEADV3 PROCESS MEGAWATTS 1.94 PROCESS TEMP. 250. PROCESS HEAT(BTU*10**6) 24.
DIESEL-ADVANCED-3 SITE FUEL= RESIDUAL COGEN FUEL BTU*10**6= 18. KW FUEL= 5228.

ISLAND DESCRIPTION	COMPONENT DESCRIPTION	******************COSTS - MILLIONS 1978$*********** MAJOR EQUIPMNT	INSTALL MAT'L	INSTALL LABOR	INDRCT FLD CST	TOTAL INSTALLD	TOTAL	$PER-KW FUEL
1. FUEL-HANDLING	1. FUEL-OIL-UNLOADING-S	0.035	0.007	0.042	0.037	0.086	0.121	23.081
	ISLAND TOTAL	0.035	0.007	0.042	0.037	0.086	0.121	23.081
3. ENERGY-CONVERSION	32. DIESEL-ENGINE-GENERA	1.453	0.163	0.163	0.146	0.471	1.925	368.094
	ISLAND TOTAL	1.453	0.163	0.163	0.146	0.471	1.925	368.094
2. FUEL-UTILIZATION-CLE	21. OIL-FIRED-BOILER	0.095	0.196	0.299	0.269	0.764	0.859	164.319
	ISLAND TOTAL	0.095	0.196	0.299	0.269	0.764	0.859	164.319
8. BALANCE-OF-PLANT	84. POWER-PLANT-STRUCTUR	0.	0.064	0.056	0.050	0.169	0.169	32.400
	80. MASTER-CONTROL	0.070	0.010	0.017	0.016	0.043	0.113	21.626
	81. ELECTRIC-SWITCHGEAR-	0.	0.013	0.013	0.011	0.037	0.037	7.018
	82. INTERCONNECTING-PIPI	0.	0.025	0.025	0.022	0.071	0.071	13.666
	83. STRUCTURES-MISCELLAN	0.	0.055	0.047	0.042	0.145	0.145	27.721
	ISLAND TOTAL	0.070	0.167	0.157	0.142	0.466	0.536	102.431
TOTAL THIS CASE		1.652	0.532	0.661	0.595	1.788	3.440	113.746
INDIRECT COSTS	SPARES						0.033	
	START UP						0.028	
	SPARES+STARTUP						0.061	
	CONTINGENCY						0.525	
	ENGINEERING SERVICES						0.210	
	A-E FEE						0.175	
GRAND TOTAL							4.412	

Figure 12-9. Sample Capital Cost Report

Table 12-8

NASA APPROVED SELECTED CASES

	ECS / Fuel	Steam Turbine						Gas Turbine SOA		Diesel SOA		PFB Steam Turbine	Thermionic				Stirling			Helium Closed Turbine			Fuel Cell MC			Fuel Cell PA	IGT. Gasifier	Gas Turbine AC			Gas Turbine WC	Combined Cycle AC			Combined Cycle WC	Steam Inj. GT			Diesel Adv.	Diesel Heat Pump	Gas Turbine Reg. AC					
		1 STM141 Coal F	1 STM141 Coal A	1 STM141 PTR R	2 STM088 Coal F	2 STM088 Coal A	2 STM088 PTR A	13 GTSOAR PTR R	32 GTSOAD PTR D	29 DESOA3 PTR P	29 DESOA3 PTR D	3 PFBSTM Coal P	4 TISTMT Coal F	4 TISTMT PRT R	5 TIHRSG Coal F	5 TIHRSG PRT R	6 STIRL Coal F	6 STIRL PTR R	6 STIRL PTR D	7 HEGT85 Coal A	8 HEGT60 Coal A	9 HEGT00 Coal A	10 FCMCCL Coal X	46 FCMCDS PTR D	11 FCSTCL Coal X	45 FCPADS PTR D	12 IGGTST Coal X	14 GTAC08 PTR R	15 GTAC12 PTR R	16 GTAC16 PTR R	17 GTWC16 PTR R	19 CC1622 PTR R	20 CC1222 PTR R	21 CC0822 PTR R	18 CC1626 PTR R	22 STIG15 PTR R	23 STIG10 PTR R	24 STIG15 PTR R	25 DEADV3 PTR R	28 DEHTPM PTR R	33 GTRA08 PTR D	34 GTRA12 PTR D	35 GTRA16 PTR D	36 GTR208 PTR D	37 GTR212 PTR D	38 GTR216 PTR D
Food	20111									P								P								P													P	P						
Food	20461	H	B									H																																		
Food	20821						P				P							P								P													P			P			P	
Textile	22601					H				P							P							P																						
Lumber	24211																	P																												
Lumber	24361																	P																												
Lumber	24921							H									H	P	P																											
Paper	26212	H	H					P				B										P																								
Paper	26214	P		P		P						H				P										P																				
Paper	28216	H	H	H					P																												P									
Paper	26217							P	P															P					P	P	P			B	P		P	P								
Paper	26218	H	H																																											
Chemicals	28001		H			P						H																																		
Chemicals	28002	H	H									B			H																															
Chemicals	28003							P				H	P		H					P	P	P	B		B		P		P					P												
Chemicals	28121							H	H					H						P				P	H		H			H		H			H		P	P				H			H	
Chemicals	28212					H																																								
Chemicals	28221							H			P															P				P									P	P						
Chemicals	28242									P																							H						P	H						
Chemicals	28653	H	H																																											
Chemicals	28951							P									H	H																						P						
Petroleum	29112	P	H					P				H				P																														
Petroleum	29113	P										P	P	P											H																					
Metals	33121							H																									H													
Metals	33251	H																							H					H		H			P											
Metals	33254																																H													
Metals	33314								H																				H	H		P	P	P					P	H						
Metals	33315																															P	P		P			P								
Metals	33344		B									H																																		

Match
Heat H
Power P
Both B

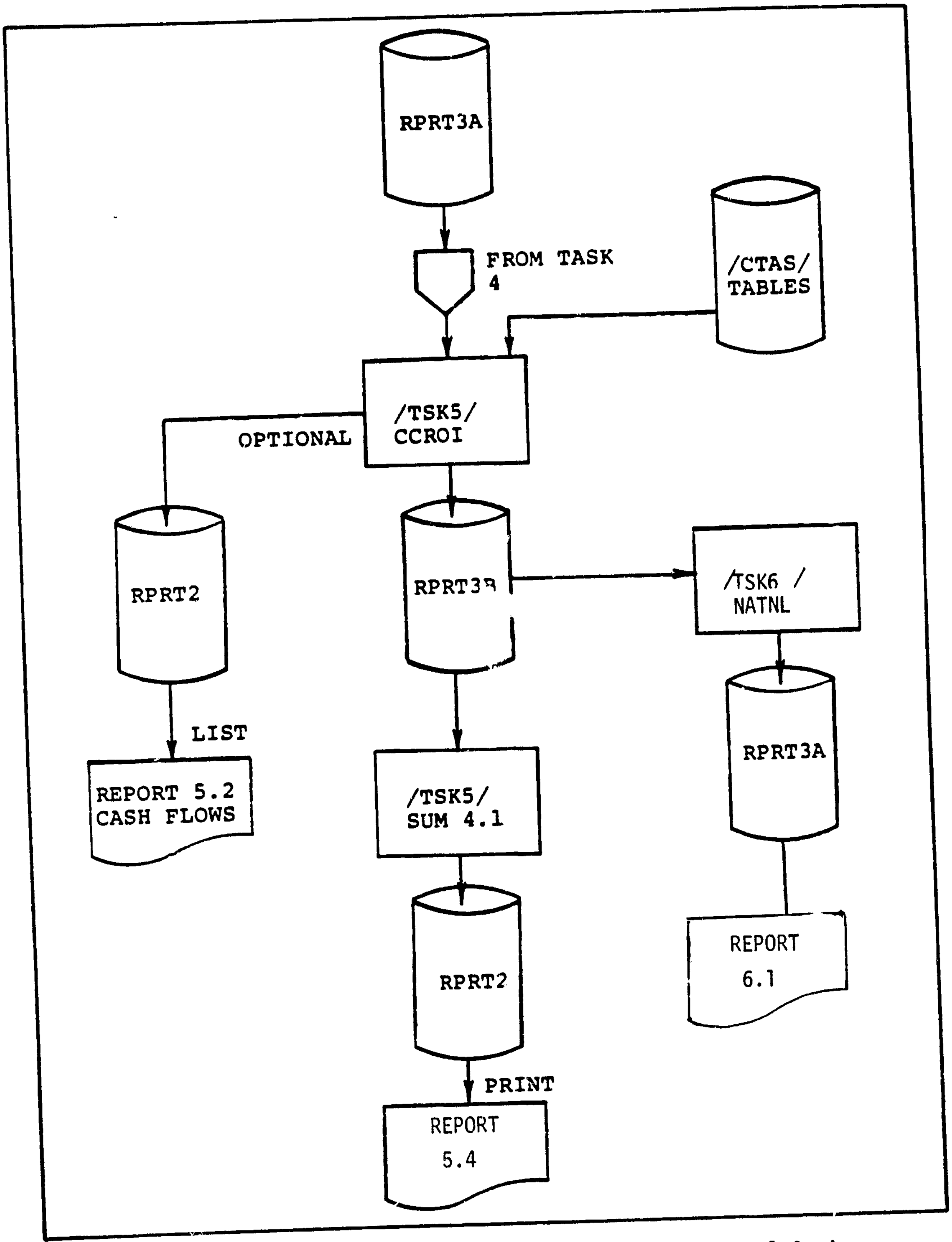

Figure 12-10. Data Handling - Economics and Potential National Savings

Table 12-9

ECONOMIC ANALYSIS GROUNDRULES
(All Costs are in 1978 Constant Dollars)

Factor	Value
Annual inflation rate	0
Cost of debt (before taxes) above inflation	3%
Fraction of debt in capital	30%
Cost of preferred equity above inflation	-
Fraction of preferred equity in capital	0
Cost of common equity above inflation	7%
Fraction of common equity in capital	70%
Federal & State income tax rate	50%
Tax depreciation method	Sum of Years Digits
Tax depreciation life	15 Years
Salvage value	0
Investment tax credit	10%
Local real estate taxes and insurance	3%
Useful life of investment	30 Years
First full year of operation	1990
Capital cost escalation rate above inflation	0
Cost of Fuels, Power & Expendables for 1985 in 1978 $'s	
Coal	$\$1.80/10^6$ Btu
Distillate Oil (Petroleum or Coal Derived)	$\$3.80/10^6$ Btu
Residual Oil (Petroleum or Coal Derived)	$\$3.10/10^6$ Btu
Natural Gas	$\$2.40/10^5$ Btu
Purchased Power	$0.033/kWh
Limestone	$10.00/Ton
Dolomite	$12.50/Ton
Escalation of Fuels & Power Above Inflation	
Coal	1%
Distillate Oil (Petroleum or Coal Derived)	1%
Residual Oil (Petroleum or Coal Derived)	1%
Natural Gas	4.6% (1985-2000) 1.0% (2000-)
Purchased & Exported Power	1%
Limestone	0
Dolomite	0

Price of surplus power exported to utility = 0.6 x purchased power rate = 0.6 x 0.033 = $0.0198/kWh.

Operating and Maintenance Costs. The operating and maintenance costs were established as a function of ECS and type of fuel used as described in Table 12-10 and shown in Figure 12-11.

Table 12-10

CONTENTS OF OPERATING AND MAINTENANCE TABLE

O&M Costs = L*(fuel flow)M+N*(Capital Cost)+P*(fuel flow*operating hrs/yr)

L*(fuel flow)M	is cost of operating labor in 10^6 \$/yr with fuel flow in Btu/hr.
N*(Capital Cost)	is cost of parts for maintenance and major replacements in 10^6 \$/yr with capital cost in 10^6\$.
P*(fuel flow*operating hrs/yr)	is cost of limestone, dolomite, ZnO, and water in 10^6 \$/yr with fuel flow in 10^6 Btu/hr.

L, M, N, and P are stored on this table along with the time for construction. These values depend on the ECS and fuel type.

ROI Analysis Program (CCROI). This program evaluates the year by year cash flow of each case. The cash flow of the nocogeneration case is compared to the cash flow of the cogeneration case, and the discount rate (ROI) is determined that makes the difference in cash flows of these two cases equal to their difference in capital cost. Due to the groundrules established in this study, some cases yield infinite ROI's because both the cogeneration capital cost and annual costs are less than the nocogeneration capital cost and annual costs. Other cases resulted in negative ROI's. These negative values were caused by capital costs favoring cogeneration, but with the cogeneration annual costs exceeding the nocogeneration annual costs. Levelized Annual Energy Costs (LAEC) are not based on incremental costs or cash flows and thus are more continuous than ROI. Levelized capital, taxes and insurance, operating and maintenance, fuel, purchased electricity, and revenue are the components of

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FUNCTION?

			ECS	DISTILLATE & RESIDE Const. Yrs.	OPN Labor Factor L	OPN Labor Expon. M	Maint. N	Mat'l P	COAL: FGD, PFB, PULVERIZED & GASIFIED Const. Yrs.	OPN Labor Factor L	OPN Labor Expon. M	Maint. N	Mat'l P	AFB Const. Yrs.	OPN Labor Factor L	OPN Labor Expon. M	Maint. N	Mat'l P
1530	140	1	STM141	2.5	1174.	0.300	0.025	0.	3.0	1751.	0.300	0.025	0.082	3.0	1463.	0.300	0.025	0.112
1540	140	2	STM088	2.5	1174.	0.300	0.025	0.	3.0	1751.	0.300	0.025	0.075	3.0	1463.	0.300	0.025	0.112
1550	140	3	PFBSIM	0.	0.	0.	0.	0.	2.5	1463.	0.300	0.025	0.272	0.	0.	0.	0.	0.
1560	140	4	TISTMT	2.5	1174.	0.300	0.025	0.006	3.0	1751.	0.300	0.025	0.075	0.	0.	0.	0.	0.
1570	140	5	TIHRSG	2.0	270.	0.360	0.025	0.	2.5	536.	0.350	0.025	0.075	0.	0.	0.	0.	0.
1580	140	6	STIRL	1.5	324.	0.360	0.025	0.	2.0	489.	0.360	0.025	0.075	0.	0.	0.	0.	0.
1590	140	7	HEGT85	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.5	355.	0.350	0.025	0.112
1600	140	8	HEGT60	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.5	355.	0.350	0.025	0.112
1610	140	9	HEGT00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.5	355.	0.350	0.025	0.112
1620	140	10	FCMCCL	0.	0.	0.	0.	0.	3.5	508.	0.340	0.025	0.303	0.	0.	0.	0.	0.
1630	140	11	FCSTCL	0.	0.	0.	0.	0.	4.0	1401.	0.300	0.025	0.306	0.	0.	0.	0.	0.
1640	140	12	IGGIST	0.	0.	0.	0.	0.	4.0	1751.	0.300	0.025	0.	0.	0.	0.	0.	0.
1650	140	13	GTSOAR	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1660	140	14	GTAC08	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1670	140	15	GTAC12	1.5	270.	0.350	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1680	140	16	GTAC16	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1690	140.	17	GTWC16	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1700	140	18	CC1626	2.5	1174.	0.300	0.025	0.003	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1710	140	19	CC1622	2.5	1174.	0.300	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1720	140	20	CC1222	2.5	1174.	0.300	0.025	0.003	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1730	140	21	CC0822	2.5	1174.	0.300	0.025	0.003	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1740	140	22	STIG15	1.5	270.	0.360	0.025	0.112	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1750	140	23	STIG10	1.5	270.	0.360	0.025	0.071	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1760	140	24	STIGIS	1.5	270.	0.360	0.025	0.071	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1770	140	25	DEADV3	1.5	324.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1780	140	26	DEADV2	1.5	324.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1790	140	27	DEADV1	1.5	324.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1800	140	28	DEHTPM	1.5	378.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1810	140	29	DESOA3	1.5	324.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1820	140	30	DESOA2	1.5	324.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1830	140	31	DESOA1	1.5	324.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1840	140	32	GTSOAD	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1850	140	33	GTRA08	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1860	140	34	GTRA12	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1870	140	35	GTRA16	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1880	140	36	GTR208	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1890	140	37	GTR212	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1900	140	38	GTR216	1.5	270.	0.350	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1910	140	39	GTRW08	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1920	140	40	GTRW12	1.5	270.	0.350	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1930	140	41	GTRW16	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1940	140	42	GTR308	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1950	140	43	GTR312	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1960	140	44	GTR316	1.5	270.	0.360	0.025	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1970	140	45	FCPADS	1.5	137.	0.360	0.025	1.236	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1980	140	46	FCMCDS	1.5	137.	0.350	0.025	1.236	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1990	140	47	O10CGB	1.5	622.	0.320	0.025	0.	3.0	1002.	0.300	0.025	0.075	3.0	1163.	0.300	[illegible]	0.112

Figure 12-11. CTAS Operating and Maintenance Factors Table for 10^6\$/Yr

the total LAEC. The ratio of this cogeneration LAEC divided by the no-cogeneration LAEC is shown under the NORML column. Besides LAEC and ROI, the present worth of the investment at a 15% discount rate, and the net payback are calculated. Figure 12-12 shows the format of the output of Report 5.4 with capital costs at the base (0% change from calculated) values. Report 5.4 in the format of Figure 12-12 for base (0% change) groundrule costs for the coal-fired nocogeneration process boiler base case and all of the ECS-process matches is included in Volume VI, Part 1. Volume VI, Part 2 contains Report 5.4 results for the oil-fired nocogeneration process boiler base case.

Other calculations show the sensitivity to changes in the various factors. Figure 12-13, for example, shows the sensitivities of economic factors to capital cost, fuel cost, and power cost in graphical form. These sensitivities for LAEC were calculated on the selected matches shown in Table 12-8 for the coal-fired nocogeneration process boiler base case. The graphical results are included behind Report 5.4, Part 1. An attempt was made to use this computer routine to calculate these sensitivities on ROI, but because of the many matches where a positive ROI does not exist and the rapid change in ROI to changes in costs, very limited results were obtained. The sensitivity of these cost changes on ROI are best understood and calculated by using the methodology described in Volume V, Sections 9.5 and 9.6.

Report 5.2 - Summary of Fuel Saved by Type and Economics

This summary Report 5.2 shows the fuel saved by type and the economics of the process and ECS matches. A sample page is shown in Figure 12-14. The report accounts for fuel differences in both type and quantity in 10^6 Btu/hr used between the nocogeneration case, and the cogeneration case including the displacement of utility fuel that occurs due to on-site power generation. In the cogeneration case any fuel burned on-site is added to any utility fuel burned due to a shortfall of on-site power. The fuel savings (nocogen-cogen heading on the report) shows what fuel was saved (positive quantity in the column under the appropriate fuel)

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BASE-PEO-ADV-ENERGY-SYS — COGENERATION TECHNOLOGY ALTERNATIVES STUDY

REPORT 6.4

ECONOMIC SENSITIVITY REPORT FOR SELECTED PROCESS-ECS MATCHES

SENSITIVITY OF CAPITAL COST — PERCENT OF ORIGINAL COST 100

ENERGY CONV SYSTEM		SITE-FUEL	POWER REQD MW	POWER GEN/REQD	FESR	POWER /HEAT RATIO	CAPITAL COST *10**6	CAPITAL	TAXES + INSNC	OANDM	FUEL	PURCHD ELEC	REVNUE	TOTAL	NORML	PRESNT WORTH 15%	ROI %	GROSS PAY BACK
								LEVELIZED ANNUAL ENERGY COSTS($ MILLIONS)										
10101	ONOCGN	COAL-FG	10.	0.	0.	0.25	12.3	0.93	0.40	0.83	0.74	3.06	0.	5.97	1.000	0.	0	0
10101	STM141	RESIDUA	10.	0.99	0.439	0.25	8.3	0.63	0.27	0.57	2.42	0.03	0.	3.93	0.658	8.	999	0
10101	STM141	COAL-FG	10.	0.99	0.439	0.25	18.2	1.23	0.52	1.08	1.41	0.03	0.	4.27	0.715	3.	28	4
10101	STM141	COAL-AF	10.	0.99	0.439	0.25	12.8	0.96	0.40	0.96	1.41	0.03	0.	3.74	0.628	7.	999	1
10101	STM088	RESIDUA	10.	0.76	0.333	0.25	7.4	0.56	0.24	0.64	2.16	0.76	0.	4.26	0.713	8.	999	0
10101	STM088	COAL-FG	10.	0.75	0.333	0.25	14.8	1.13	0.46	1.02	1.28	0.76	0.	4.65	0.778	3.	31	4
10101	STM088	COAL-AF	10.	0.75	0.333	0.25	11.8	0.89	0.38	0.92	1.26	0.76	0.	4.20	0.704	6.	999	0
10101	PFBSTM	COAL-Pr	10.	1.00	0.436	0.25	20.8	1.58	0.67	1.59	1.43	0.	0.	5.27	0.882	-2.	10	8
10101	PFBSTM	COAL-PF	10.	1.62	0.464	0.25	19.9	1.51	0.64	1.48	1.79	0.	-0.98	4.44	0.744	1.	17	6
10101	TISTMT	RESIDUA	10.	1.00	0.187	0.25	29.8	2.26	0.96	1.27	3.55	0.	0.	8.02	1.344	-16.	0	83
10101	TISTMT	RESIDUA	10.	0.64	0.236	0.25	20.8	1.55	0.66	1.01	1.91	1.42	0.	6.56	1.099	-6.	0	999
10101	TISTMT	COAL	10.	1.00	0.436	0.25	41.4	3.14	1.34	1.98	1.43	0.	0.	7.88	1.319	-20.	0	999
10101	TISTMT	COAL	10.	1.99	0.510	0.25	57.1	4.33	1.84	2.16	2.12	0.	-1.83	8.61	1.441	-30.	0	999
10101	TIHRSG	RESIDUA	10.	0.23	0.083	0.25	17.8	1.30	0.55	0.84	1.02	2.37	0.	6.68	1.119	-8.	0	68
10101	TIHRSG	COAL	10.	0.85	0.306	0.25	48.1	3.65	1.55	1.78	1.49	0.47	0.	8.92	1.494	-28.	0	999
10101	STIRL	DISTILL	10.	1.00	0.148	0.25	11.1	0.82	0.35	0.77	4.56	0.	0.	6.51	1.090	-1.	-28	0
10101	STIRL	DISTILL	10.	0.63	0.201	0.25	9.3	0.69	0.29	0.70	2.88	1.18	0.	5.69	0.953	2.	999	0
10101	STIRL	RESIDUA	10.	1.00	0.148	0.25	11.1	0.83	0.35	0.77	3.72	0.	0.	5.67	0.949	2.	999	0
10101	STIRL	RESIDUA	10.	0.63	0.201	0.25	9.3	0.69	0.29	0.70	2.33	1.18	0.	5.18	0.8[illegible]5	4.	999	0
10101	STIRL	COAL	10.	1.00	0.321	0.25	21.8	1.62	0.69	1.44	1.72	0.	0.	5.47	0.917	-3.	8	10
10101	STIRL	COAL	10.	2.32	0.365	0.25	28.1	2.08	0.88	1.43	3.02	0.	-2.43	4.98	0.834	-4.	8	9
10101	HEGT85	COAL-AF	10.	1.00	0.176	0.25	35.4	2.68	1.14	1.69	2.09	0.	0.	7.60	1.273	-16.	0	999
10101	HEGT85	COAL-AF	10.	6.10	0.235	0.25	91.7	6.96	2.96	3.34	8.97	0.	-9.43	12.80	2.144	-60.	0	999
10101	HEGT60	COAL-AF	10.	1.00	0.161	0.25	34.0	2.58	1.10	1.66	2.08	0.	0.	7.38	1.237	-15.	0	999
10101	HEGT60	COAL-AF	10.	3.00	0.236	0.25	55.1	4.18	1.78	2.12	4.89	0.	-3.70	9.08	1.520	-30.	0	999
10101	HEGT00	COAL-AF	10.	1.00	0.168	0.25	31.2	2.37	1.01	1.58	2.07	0.	0.	7.01	1.173	-12.	0	999
10101	HEGT00	COAL-AF	10.	1.40	0.203	0.25	33.4	2.53	1.08	1.41	2.00	0.	-0.74	6.88	1.152	-13.	0	26
10101	FCMCCL	COAL	10.	1.00	-0.403	0.25	29.8	2.32	0.99	1.72	3.56	0.	0.	8.58	1.437	-17.	0	74
10101	FCMCCL	COAL	10.	2.57	0.092	0.25	40.3	3.13	1.33	2.09	4.88	0.	-2.80	8.53	1.428	-22.	0	999
10101	FCSTCL	COAL	10.	1.00	-0.368	0.25	29.0	2.25	0.96	1.73	3.52	0.	0.	8.47	1.418	-16.	0	74
10101	FCSTCL	COAL	10.	4.18	0.266	0.25	50.3	3.91	1.66	2.68	6.06	0.	-5.87	8.41	1.409	-27.	0	999
10101	IGGTST	COAL	10.	1.00	-0.466	0.25	28.9	2.26	0.96	1.61	3.72	0.	0.	8.53	1.428	-10.	0	72
10101	IGGTST	COAL	10.	2.95	0.065	0.25	40.4	3.14	1.34	1.84	5.65	0.	-3.80	8.18	1.370	-21.	0	999
10101	GTSOAR	RESIDUA	10.	1.00	0.218	0.25	10.6	0.78	0.33	0.71	3.42	0.	0.	5.25	0.879	3.	999	0
10101	GTSOAR	RESIDUA	10.	0.71	0.208	0.25	8.8	0.71	0.30	0.67	2.43	0.89	0.	5.00	0.838	4.	999	0
10101	GTAC08	RESIDUA	10.	1.00	0.168	0.25	9.8	0.71	0.30	0.68	3.68	0.	0.	5.37	0.899	3.	999	0
10101	GTAC08	RESIDUA	10.	0.67	0.215	0.25	8.3	0.62	0.26	0.63	2.10	1.32	0.	4.9[illegible]	0.826	5.	999	0
10101	GTAC12	RESIDUA	10.	1.00	0.255	0.25	9.8	0.72	0.31	0.68	3.26	0.	0.	4.97	0.832	4.	999	0
10101	GTAC12	RESIDUA	10.	0.71	0.265	0.25	8.8	0.65	0.28	0.65	2.30	0.90	0.	4.78	0.801	6.	999	0
10101	GTAC16	RESIDUA	10.	1.00	0.296	0.25	10.1	0.75	0.32	0.69	3.07	0.	0.	4.83	0.810	6.	999	0
10101	GTAC16	RESIDUA	10.	0.79	0.295	0.25	9.4	0.70	0.30	0.68	2.44	0.63	0.	4.73	0.792	6.	999	0
10101	GTWC16	RESIDUA	10.	1.00	0.279	0.25	10.4	0.77	0.33	0.70	3.18	0.	0.	4.95	0.830	4.	999	0
10101	GTWC16	RESIDUA	10.	0.85	0.260	0.25	8.8	0.73	0.31	0.68	2.87	0.44	0.	4.87	0.815	6.	999	0

Figure 12-12. Sample Economic Sensitivity Report

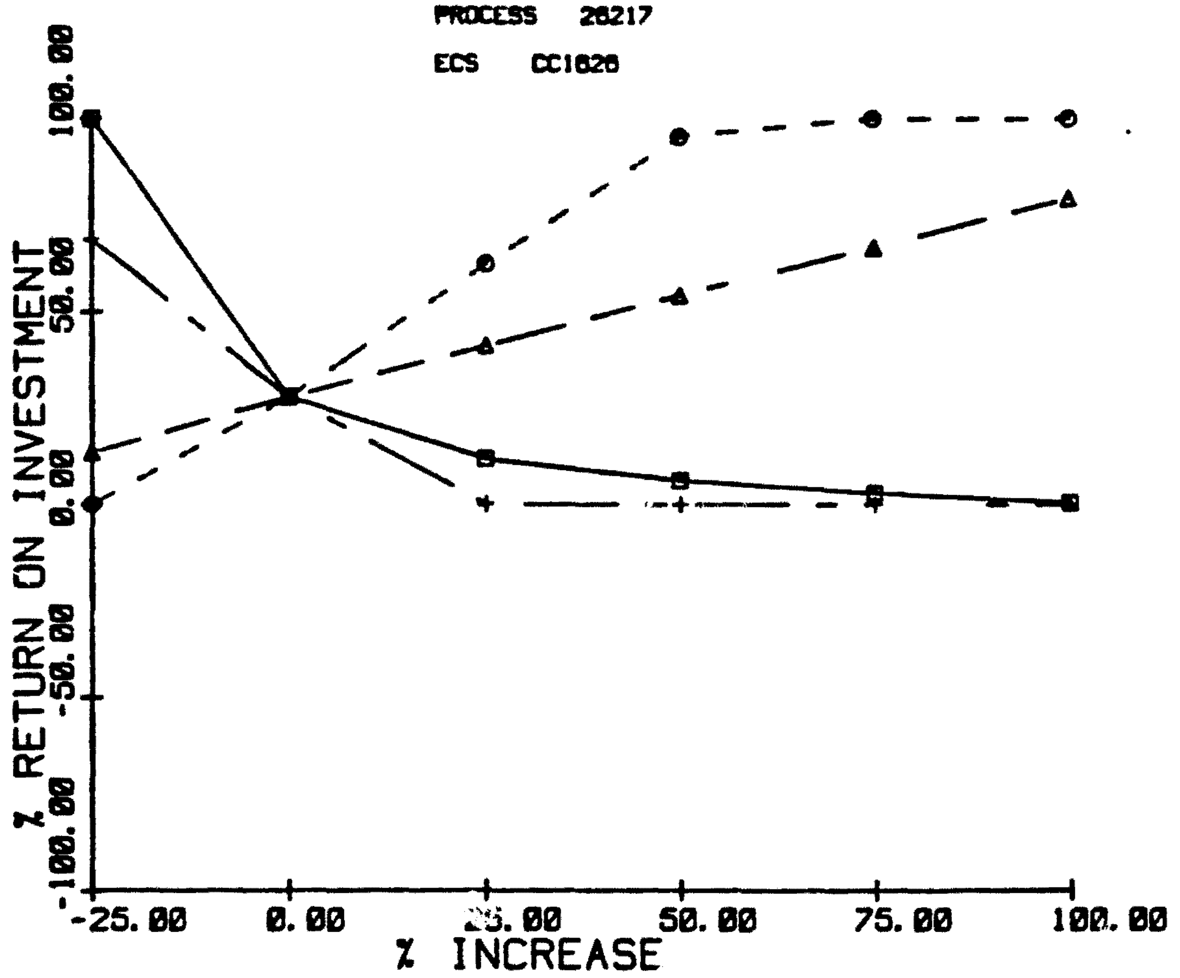
DATE04/17/79

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

SENSITIVITY STUDY

PROCESS 28217

ECS CC1828



BASE CASE

PROCESS	NO COGENERATION	COGENERATION
MW- 31		CAPITAL COST- 18.1
PROCESS HEAT- 183 (BTU*10**6)	CAPITAL COST- 14.8	LAEC - 15.150
	LAEC - 18.517	ROI - 27
WASTE FUEL- 0 (BTU*10**6)	FUEL - COAL-FGD	MW(GEN) - 31
		FUEL - RESIDUAL
POWER/HEAT- 0.584		

CAPITAL COST

ELECTRIC POWER

NO-CGN FUEL

ECS FUEL

Figure 12-13. Sample Economic Sensitivity

ORIGINAL PAGE IS OF POOR QUALITY

DATE 04/22/78
I SE-PEO-ADV-DES-ENGR

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 8.2
SUMMARY OF FUEL SAVED BY TYPE ECONOMICS

PAGE 1

		------------FUEL USE IN BTU*10**6	------------																	
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GNOCON	10101	0.	28.	128.	0.	0.	0.	F	10.	0.	0.83	0.26	0.	12.3	1.00	260.1	0	8.0	1.00	80
STM141	10101	0.	84.	1.	0.	-69.	126.		10.	10.	0.57	0.25	0.44	8.3	0.68	141.8	999	3.6	0.66	178
STM141	10101	0.	0.	94.	0.	24.	42.	F	10.	10.	1.09	0.25	0.44	16.2	1.32	279.2	29	4.3	0.71	160
STM141	10101	0.	0.	84.	0.	24.	42.	A	10.	10.	0.96	0.25	0.44	12.5	1.01	211.6	999	3.7	0.63	164
STM088	10101	0.	80.	20.	0.	-66.	108.		10.	8.	0.64	0.26	0.33	7.4	0.80	132.5	999	4.3	0.71	166
STM088	10101	0.	8.	94.	0.	18.	32.	F	10.	8.	1.02	0.25	0.33	14.8	1.22	266.6	31	4.8	0.78	150
STM088	10101	0.	8.	94.	0.	18.	32.	A	10.	8.	0.92	0.25	0.33	11.8	0.98	209.8	999	4.2	0.70	154
PFBSTM	10101	0.	0.	66.	0.	26.	41.		10	10.	1.59	0.26	0.44	20.6	1.69	351.2	10	6.3	0.88	169
PFBSTM	10101	0.	0.	108.	0.	37.	82.		10.	18.	1.48	0.26	0.48	19.9	1.62	304.3	17	4.4	0.74	180
TISTMT	10101	0.	122.	0.	0.	-87.	128.		10.	10.	1.27	0.26	0.18	28.6	2.41	496.5	0	8.0	1.34	143
TISTMT	10101	0.	77.	38.	0.	-52.	88.		10.	5.	1.01	0.25	0.23	20.5	1.67	381.1	0	8.8	1.10	136
TISTMT	10101	0.	0.	88.	0.	25.	41.		10.	10.	1.96	0.26	0.44	41.4	3.37	698.8	0	7.8	1.32	168
TISTMT	10101	0.	0.	126.	0.	48.	82.		10.	20.	2.16	0.26	0.61	67.1	4.86	800.8	0	8.8	1.44	160
TIHRSG	10101	0.	74.	83.	0.	-80.	62.		10.	2.	0.84	0.26	0.08	17.8	1.43	346.6	0	8.7	1.12	112
TIHRSG	10101	0.	4.	101.	0.	21.	25.		10.	8.	1.79	0.25	0.31	48.1	3.82	798.3	0	8.8	1	143
STIRL	10101	128.	0.	0.	-128.	28.	128.		10.	10.	0.77	0.26	0.18	11.1	0.81	173.1	-28	8.8	1	183
STIRL	10101	80.	8.	31.	-80.	16.	66.		10.	6.	0.70	0.26	0.20	8.3	0.76	160.7	999	8.7	0	148
STIRL	10101	0.	128.	0.	0.	-103.	128.		10.	10.	0.77	0.26	0.18	11.1	0.81	173.3	999	8.7	[illegible]	150
STIRL	10101	0.	89.	31.	0.	-66.	95.		10.	8.	0.70	0.26	0.20	8.3	0.76	160.6	999	6.2	[illegible]	147
STIRL	10101	0.	0.	102.	0.	25.	24.		10.	10.	1.44	0.26	0.32	21.8	1.78	340.6	8	6.6	[illegible]2	185
STIRL	10101	0.	0.	178.	0.	57.	88.		10.	23.	1.43	0.26	0.36	28.1	2.20	323.2	8	8.0	0.83	137
HEGT85	10101	0.	0.	123.	0.	25.	2.	A	10.	10.	1.88	0.26	0.18	36.4	2.86	800.8	0	7.8	1.27	137
HEGT85	10101	0.	0.	631.	0.	160.	14.	A	10.	61.	3.34	0.25	0.24	81.7	7.46	482.4	0	12.8	2.14	113
HEGT60	10101	0.	0.	122.	0.	26.	4.	A	10.	10.	1.68	0.25	0.18	34.0	2.78	484.4	0	7.4	1.24	139
HEGT60	10101	0.	0.	278.	0.	74.	12.	A	10.	30.	2.12	0.26	0.24	66.1	4.49	478.1	0	8.1	1.62	120
HEGT00	10101	0.	0.	122.	0.	26.	3.	A	10.	10.	1.66	0.26	0.16	31.2	2.84	444.8	0	7.0	1.17	138
HEGT00	10101	0.	0.	184.	0.	34.	8.	A	10.	14.	1.41	0.26	0.20	33.4	2.72	418.8	0	8.8	1.16	128
FCMCCL	10101	0.	0.	211.	0.	26	-66.		10.	10.	1.72	0.26	-0.40	26.8	2.43	483.1	0	8.8	1.44	71
FCMCCL	10101	0.	0.	269.	0.	63.	-34.		10.	28.	2.08	0.25	0.08	40.3	3.26	476.4	0	8.8	1.43	167
FCSTCL	10101	0.	0.	208.	0.	26.	-83.		10.	10.	1.73	0.26	-0.38	28.0	2.38	474.8	0	8.6	1.42	73
FCSTCL	10101	0.	0.	359	0.	102.	26.		10.	42.	2.66	0.26	0.27	80.3	4.09	478.2	0	8.4	1.41	113
IGGTST	10101	0.	0.	220.	0.	26.	-84.		10.	10.	1.81	0.26	-0.47	28.8	2.36	448.2	0	8.6	1.43	84
IGGTST	10101	0.	0.	335.	0.	72.	-48.		10.	28.	1.64	0.25	0.08	40.4	3.28	412.3	0	8.2	1.37	98
GT50AR	10101	0.	118.	0.	0.	-93.	128.		10.	10.	0.71	0.25	0.22	10.8	0.86	188.2	999	6.3	0.88	158
GT50AR	10101	0.	91.	24.	0.	-68	102.		10.	7.	0.67	0.25	0.24	9.8	0.76	182.0	999	6.0	0.84	151
GTAC08	10101	0.	128.	0.	0.	-102.	128.		10.	10.	0.88	0.26	0.16	8.6	0.78	165.0	999	6.4	0.90	154
GTAC08	10101	0.	83.	38.	0.	-56.	80.		10.	8.	0.63	0.26	0.21	8.3	0.88	148.7	999	4.8	0.63	150
GTAC12	10101	0.	112.	0.	0.	-87.	128.		10.	10.	0.68	0.25	0.26	8.8	0.80	167.8	999	8.0	0.83	164
GTAC12	10101	0.	88.	24.	0.	-82.	102.		10.	7.	0.66	0.25	0.27	8.8	0.72	163.2	999	4.8	0.80	165
GTAC16	10101	0.	108.	0.	0.	-81.	128.		10.	10.	0.68	0.26	0.30	10.1	0.82	182.8	999	4.8	0.81	167
GTAC16	10101	0.	89.	17.	0.	-64.	108.		10.	8.	0.66	0.26	0.30	8.4	0.76	159.0	999	4.7	0.79	158
GTWC16	10101	0.	108.	0.	0.	-84.	128.		10.	10.	0.70	0.26	0.20	10.4	0.85	182.8	999	8.0	0.83	168
GTWC16	10101	0.	68.	13.	0.	-71.	113.		10.	8.	0.68	0.25	0.28	8.6	0.60	161.1	999	4.8	0.82	165

Figure 12-14. Sample Fuel Saved By Type + Economics Report

and how much. The single letters F and A appearing after the cogen coal column in Figure 12-14 indicate FGD or AFB coal systems. On other pages of the report P indicates a PFB coal system.

Other data included in Report 5.2 are the process power requirements (POWER REQD), on-site cogeneration power produced (COGEN POWER), the process power over heat ratio (POWER/HEAT), the fuel energy saved ratio (FESR) and summary economic parameters. These parameters include the operating and maintenance cost in 10^6 dollars (CAPITAL COST), the ratio of the on-site cogeneration ECS over the nocogeneration process boiler capital costs (NORM COST), return on investment (ROI), levelized annual energy cost (LEVL CHRG) and the ratio of cogeneration over nocogeneration LAEC (NORM ENGR). The parameters in the columns "$/kW EQVL" and "WRTH" did not prove useful and shoud be ignored.

Report 6.1 - Fuel and Emissions Savings

Figure 12-15 shows an example of computer report 6.1, the Fuel and Emissions Savings by type, emissions saved ratio (EMSR), capital saving, total export megawatt hours, cost of electricity and LAEC savings for process-ECS matches and Figure 12-16 on a national basis.

Input requirements for this program include the Emissions by ECS and Fuel (Table 12-11) and a table on National Energy Use by SIC (Table 12-12).

The FESR is scaled by multipliers discussed in Section 10 (Volume V) so that

$$\underset{\text{(2-digit)}}{\text{FESR}} = \underset{\text{(CTAS)}}{\text{FESR}} * \underset{\text{(Process to 2-digit)}}{\text{Multiplier}}$$

$$\underset{\text{(National)}}{\text{FESR}} = \underset{\text{(2-digit)}}{\text{FESR}} * \underset{\text{(2-digit to National)}}{\text{Multiplier}}$$

DATE 04/24/78 GENERAL ELECTRIC COMPANY PAGE 1
ISE PEO AES COGENERATION TECHNOLOGY ALTERNATIVES STUDY
FUEL UNITS = Quads REPORT 8.1 FUEL AND EMISSIONS SAVINGS (SAVINGS ARE POSITIVE)
EMISSION UNITS= 1000 tons/hr TIME 1990 LEVEL ALL
COST =$*10**9 TYPE MATCH=HEAT

			*****F U E L		S A V I N G S*****			- - E M I S S I O N S			S A V I N G S - - -				CAPITL--ELECTRIC POWER---			
PROCS	ECS	ECS FUEL	****DIRECT**** OIL+GAS	COAL	-----TOTAL---- OIL+GAS	COAL	FESR	-------DIRECT------- NOX	SOX	PART	********TOTAL******** NOX	SOX	PART	EMSR	SAVING	TOTAL EXPORT MWH	SVNG	LAEC SAVED
20	STM141	COAL-A	0.121	-0.228	0.186	-0.009	0.43	39.	-88.	-8.	131.	71.	18.	0.41	-1.	9.	284.	-497.
22	STM141	COAL-A	0.	-0.004	0.003	0.005	0.14	4.	-3.	-0	8	4.	0.	0.38	0.	0.	2.	28
24	STM141	COAL-A	0.	-0.018	0.062	0.188	0.82	-2.	-11.	-1.	84	138.	15.	0.79	-2	2.	249	-265
26	STM141	COAL-A	0.	-0.043	0.028	0.048	0.13	28.	-28.	-2.	63	37.	5	0.39	1.	1.	4.	304
28	STM141	COAL-A	0.029	-0.211	0.140	0.161	0.61	214.	-115.	-9.	370.	160.	21.	0.32	8.	18.	31.	1091.
29	STM141	COAL-A	0.	-0.025	0.015	0.026	0.10	30.	-15.	-1.	62.	21	3.	0.35	1	1.	2.	178.
33	STM141	COAL-A	0.	-0.006	0.004	0.006	0.01	4.	-3.	-0.	9.	5.	1.	0.09	0.	0.	0.	47
ALL	STM141	COAL-A	0.178	-0.629	0.512	0.497	0.19	370.	-307.	-23.	842.	498.	71.	0.34	4.	36.	849.	1037
20	STM141	COAL-F	0.121	-0.228	0.186	-0.009	0.43	-87.	-88.	-8.	35.	71.	18.	0.28	-3.	9.	283.	-929.
22	STM141	COAL-F	0.	-0.004	0.003	0.005	0.14	-2.	-3.	-0.	2.	4.	0.	0.21	0.	0.	2.	15
24	STM141	COAL-F	0.	-0.018	0.062	0.188	0.82	-7.	-11.	-1.	79.	136.	15.	0.77	-8.	2.	248.	-718.
26	STM141	COAL-F	0.	-0.043	0.026	0.045	0.13	-15.	-28.	-2.	22	37.	5.	0.23	1.	1.	4.	239
28	STM141	COAL-F	0.029	-0.211	0.140	0.161	0.61	-75.	-115.	-9.	81.	160.	21.	0.18	2.	18.	31.	768
29	STM141	COAL-F	0.	-0.025	0.015	0.026	0.10	-9.	-15.	-1.	13.	21.	3.	0.17	0.	1.	2.	139.
33	STM141	COAL-F	0.	-0.006	0.004	0.005	0.01	-4.	-3.	-0.	1.	5.	1.	0.04	0.	0	0.	28
ALL	STM141	COAL-F	0.176	-0.829	0.512	0.497	0.19	-198.	-307.	-23.	274	498.	71.	0.18	-8	36.	847.	-538
20	STM141	RESIDU	-0.325	0.218	-0.259	0.437	0.43	-87.	1.	-8.	32.	147.	-2.	0.34	4	9.	285.	-343.
22	STM141	RESIDU	-0.026	0.021	-0.022	0.030	0.14	-2.	2.	-0.	2	8.	-1.	0.30	0.	0.	2.	2
24	STM141	RESIDU	-0.021	0.003	0.041	0.209	0.82	-7.	-7.	-1.	79.	139.	14.	0.78	3.	2.	250.	613.
26	STM141	RESIDU	-0.191	0.148	-0.164	0.235	0.13	-15.	12.	-2.	20.	69.	-3.	0.32	2.	1.	4.	101.
28	STM141	RESIDU	-1.317	1.135	-1.206	1.607	0.61	-75.	164.	-9.	71.	379.	-33.	0.25	7	18.	32.	-401
29	STM141	RESIDU	-0.181	0.156	-0.166	0.207	0.10	-9.	21.	-1.	11.	52	-5.	0.27	1	1	2.	-43
33	STM141	RESIDU	-0.036	0.030	-0.032	0.042	0.01	-4.	4.	-0.	1.	11.	-1.	0.07	0.	0.	0	14.
ALL	STM141	RESIDU	-2.465	2.012	-2.129	3.138	0.19	-198.	221.	-23.	264.	947.	-35.	0.27	20.	36.	863.	-66
20	STM088	COAL-A	0.127	-0.220	0.184	-0.029	0.38	45.	-81.	-8.	126.	88.	15.	0.38	-1.	6.	236.	-489
22	STM088	COAL-A	0.	-0.004	0.002	0.004	0.11	4.	-2.	-0.	8.	3.	0.	0.35	0.	0.	2.	28
24	STM088	COAL-A	0.	-0.005	0.043	0.141	0.61	-1.	-3.	-0.	60.	101.	11.	0.58	-3.	0.	205.	-427
26	STM088	COAL-A	0.	-0.032	0.020	0.034	0.10	28.	-19.	-2.	58	28	3	0.33	1	0	4.	282
28	STM088	COAL-A	0.020	-0.108	0.073	0.069	0.24	148.	-55.	-4.	221.	70.	10.	0.28	2.	6.	18	568
29	STM088	COAL-A	0.	-0.017	0.011	0.018	0.07	33.	-10.	-1.	48.	15.	2.	0.30	1.	0.	1	144
33	STM088	COAL-A	0.	-0.004	0.002	0.004	0.00	5.	-2	-0.	8	3	0.	0.06	0	0.	0.	36
ALL	STM088	COAL-A	0.160	-0.422	0.364	0.262	0.12	286.	-189.	-13.	573.	301.	46.	0.30	0.	13.	507	141.
20	STM088	COAL-F	0.127	-0.220	0.184	-0.029	0.38	-55	-81.	-8.	28	88.	15.	0.21	-3.	6	235.	-854

Figure 12-15. Sample of National Fuel and Emissions Savings Report

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ISE PEO AES COGENERATION TECHNOLOGY ALTERNATIVES STUDY

FUEL UNITS = 10^6Btu/hr REPORT 6.1 FUEL AND EMISSIONS SAVINGS (SAVINGS ARE POSITIVE)

EMISSION UNITS= 10^{-3} Tons/hr TIME 1990 LEVEL ALL

COST =$*10**9 TYPE MATCH=POWR

PROCS	ECS	ECS FUEL	*****F U E L S A V I N G S***** ****DIRECT***** OIL+GAS	COAL	-----TOTAL----- OIL+GAS	COAL	FESR	- - - E M I S S I O N S S A V I N G S - - - -------DIRECT------- NOX	SOX	PART	********TOTAL******** NOX	SOX	PART	EMSR	CAPITL SAVING	--ELECTRIC POWER--- TOTAL EXPORT MWH	COST	LAEC SAVED
26214	DESOA3	RESIDU	-0.569	0.385	-0.569	0.645	0.12	22.	17.	15.	105.	169.	30.	0.47	19.	0.	27.	-3.
26214	DESOA3	RESIDU	-1.916	0.385	-1.916	2.547	0.25	-6766.	-490.	4.	-6073.	692.	132.	-2.20	32.	178.	43.	-32.
26214	GTSOAD	DISTIL	-0.516	0.385	-0.516	0.645	0.20	110.	147.	19.	190.	274.	14.	0.76	35.	0.	8.	-3.
26214	GTSOAD	DISTIL	-0.711	0.385	-0.711	1.034	0.31	31.	116.	19.	234.	449.	29.	0.72	67.	37.	17.	-4.
26214	GTRA08	DISTIL	0.	-0.141	0.	0.119	0.16	11.	83.	10.	95.	225.	26.	0.55	32.	0.	13.	-4.
26214	GTRA08	DISTIL	0.	-0.569	0.	0.498	0.34	-218.	-43.	3.	132.	551.	67.	0.54	66.	78.	25.	-9.
26214	GTRA12	DISTIL	0.	-0.138	0.	0.122	0.19	12.	84.	10.	96.	226.	26.	0.55	31.	0.	13.	-4.
26214	GTRA12	DISTIL	0.	-0.561	0.	0.498	0.34	-207.	-35.	3.	134.	544.	66.	0.54	83.	75.	25.	-8.
26214	GTRA16	DISTIL	0.	-0.137	0.	0.123	0.19	11.	84.	10.	95.	226.	26.	0.55	31.	0.	13.	-4.
26214	GTRA16	DISTIL	0.	-0.519	0.	0.467	0.34	-190.	-23.	4.	127.	516.	62.	0.54	76.	68.	25.	-6.
26214	GTR208	DISTIL	0.	-0.137	0.	0.123	0.19	8.	84.	10.	91.	226.	26.	0.55	33.	0	12.	-4.
26214	GTR208	DISTIL	0.	-0.429	0.	0.385	0.32	-154.	2.	5.	108.	447.	54.	0.53	71.	52.	23.	-7.
26214	GTR212	DISTIL	0.	-0.137	0.	0.122	0.19	9.	84.	10.	92.	226.	26.	0.55	32	0.	12.	-4.
26214	GTR212	DISTIL	0.	-0.462	0.	0.412	0.33	-107.	-7.	5.	114.	471.	57.	0.54	73.	58.	23.	-7.
26214	GTR216	DISTIL	0.	-0.135	0.	0.125	0.19	10.	85.	10.	94.	227.	26.	0.55	31.	0.	12.	-4.
26214	GTR216	DISTIL	0.	-0.465	0.	0.431	0.34	-166.	-8.	5.	120.	482.	58.	0.54	73.	60.	24.	-7.
26214	GTRW08	DISTIL	0.	-0.160	0.	0.100	0.16	6.	78.	10.	90.	220.	25.	0.53	32.	0	16.	-5.
26214	GTRW08	DISTIL	0.	-0.798	0.	0.500	0.30	-301.	-101.	-1.	116.	607.	76.	0.50	103.	97.	28.	-14.
26214	GTRW12	DISTIL	0.	-0.152	0.	0.108	0.17	9.	80.	10.	93.	222.	26.	0.54	32.	0.	15.	-5.
26214	GTRW12	DISTIL	0.	-0.770	0.	0.544	0.32	-290.	-94.	-0.	133.	625.	77.	0.52	104.	99.	27.	-12.
26214	GTRW16	DISTIL	0.	-0.150	0.	0.109	0.17	8.	80.	10.	93.	222.	26.	0.54	31.	0.	15.	-5.
26214	GTRW16	DISTIL	0.	-0.704	0.	0.511	0.32	-264.	-76.	1.	127.	569.	73.	0.52	96.	90.	27.	-12.
26214	GTR308	DISTIL	0.	-0.167	0.	0.093	0.14	-1.	76.	10.	83.	218.	25.	0.52	33.	0.	17.	-5.
26214	GTR308	DISTIL	0.	-0.636	0.	0.353	0.26	-237.	-56.	2.	82.	465.	60.	0.48	85.	68.	28.	-12.
26214	GTR312	DISTIL	0.	-0.148	0.	0.111	0.17	8.	81.	10.	91.	223.	26.	0.54	33.	0.	13.	-6.
26214	GTR312	DISTIL	0.	-0.603	0.	0.463	0.31	-224.	-47.	2.	116.	531.	65.	0.52	88.	75.	25.	-10.
26214	GTR316	DISTIL	0.	-0.149	0.	0.111	0.17	7.	81.	10.	91.	223.	26.	0.54	32	0.	14.	-6.
26214	GTR316	DISTIL	0.	-0.596	0.	0.444	0.31	-221.	-45.	3.	114.	524.	64.	0.52	86.	73.	26.	-10
26214	FCPAD3	DISTIL	0.	-0.175	0.	0.085	0.13	6.	74.	10.	90.	216.	25.	0.53	25.	0.	35.	-9.
26214	FCPAD3	DISTIL	0.	-1.542	0.	0.747	0.26	-246.	170.	16.	466.	1422.	151.	0.62	91.	190.	52.	-62
26214	FCMCD3	DISTIL	0.	-0.146	0.	0.113	0.18	13.	82.	10.	96.	224.	26.	0.55	24.	0.	31.	-8
26214	FCMCD3	DISTIL	0.	-1.021	0.	0.790	0.36	-613.	166.	-2.	-230.	1156.	105.	0.50	69.	145.	47.	-40.
26216	STM141	RESIDU	0.	-0.061	0.	0.101	0.21	-21.	38.	-3.	28.	114.	-8.	0.29	22.	0.	5.	0.
26216	STM141	COAL-F	0.	-0.061	0.	0.101	0.21	-21.	-37.	-3.	31.	62.	7.	0.19	8.	0.	21.	4.
26216	STM141	COAL-A	0.	-0.061	0.	0.101	0.21	67.	-37.	-3.	109.	62.	7.	0.36	16.	0.	11.	5.
26216	STM088	RESIDU	0.	-0.044	0.	0.073	0.15	-15.	43.	-2.	20.	97.	-9.	0.23	19.	0.	16.	-1.
26216	STM088	COAL-F	0.	-0.044	0.	0.073	0.15	-15.	-26.	-2.	22.	38.	5.	0.14	8.	0.	27.	3.
26216	STM088	COAL-A	0.	-0.044	0.	0.073	0.15	59.	-26.	-2.	97.	38.	5.	0.30	13.	0.	18.	3.
26216	PFBSTM	COAL-P	0.	-0.070	0.	0.109	0.23	72.	-42.	6.	130.	56.	17.	0.43	3.	0.	32.	2.
26216	PFBSTM	COAL-P	0.	-0.104	0.	0.162	0.29	76.	-62.	9.	161.	83.	25.	0.49	12.	8.	23.	4.
26216	TISTMT	RESIDU	0.	-0.069	0.	0.110	0.23	-24.	33.	-3.	31.	120.	-8.	0.30	-18.	0.	88.	-5.
26216	TISTMT	RESIDU	0.	-0.138	0.	0.218	0.33	-46.	6.	-7.	63.	187.	-3.	0.39	-27.	17.	64.	-7.
26216	TISTMT	COAL	0.	-0.069	0.	0.110	0.23	-24.	-42.	-3.	33.	56.	7.	0.21	-35.	0.	83.	-2.
26216	TISTMT	COAL	0.	-0.138	0.	0.218	0.33	-46.	-83.	-7.	66.	112.	14.	0.30	-46.	17.	65.	-3.
26216	TIHRSG	RESIDU	0.	-0.096	0.	0.080	0.17	-34.	22.	-5.	20.	108.	-10.	0.28	-33.	0.	80.	-8.
26216	TIHRSG	COAL	0.	-0.096	0.	0.080	0.17	-34.	-56.	-5.	23.	38.	6.	0.14	-53.	0.	108.	-6.

Figure 12-16. Sample of ECS-Process Fuel & Emissions Report

Table 12-11

CONTENTS OF EMISSIONS BY ECS AND FUEL

ECS Number:	For matching to appropriate ECS
ECS Description:	For information only
Same as Number:	Refers ECS back to other ECS with identical emissions
NO_x:	Pounds emitted per million Btu
SO_2:	Pounds emitted per million Btu
Particulate:	Pounds emitted per million Btu

(NO_x, SO_2 and Particulate data for each possible fuel type for each ECS)

Table 12-12

CONTENTS OF NATIONAL ENERGY USE

SIC Cod	
CTAS Process Number	
Power Match	FESR multiplier to next highest level
Heat Match	FESR multiplier to next highest level
Energy Consumption 1985	
Energy Consumption 2000	

Levels: At CTAS process level next highest level is 2-digit SIC.

: At 2-digit SIC next highest level is national.

All other factors are scaled by market size

$$\text{Scalar - 2-digit} = \frac{\text{FESR(2-digit)*Market(2-digit)}}{\text{FESR(CTAS)*Market(CTAS)}}$$

$$\text{Scalar - National} = \frac{\text{FESR(National)*Market(National)}}{\text{FESR(2-digit)*Market(2-digit)}}$$

These scaling factors account for the fact that

1. All process in a 4-digit SIC code are not represented in CTAS.
2. All 4-digit SIC codes in a 2-digit SIC code are not represented in CTAS.
3. All 2-digit SIC codes in the nation are not represented in CTAS.

Report 6.1, Fuel and Emissions Savings, is presented in two parts - (1) for each process-ECS match, and (2) an estimate of the total national savings for each ECS assumed to be implemented without competition in all new plants added because of new capacity required or to replace unserviceable plants.

In Report 6.1 by process the units of fuel saved are 10^6 Btu/hr and the emissions saved units are 10^{-3} tons/hr. DIRECT savings are on-site and TOTAL include the utility. FESR is the fuel energy saved ratio and EMSR is the emission saved ratio defined as nocogeneration minus cogeneration all over nocogeneration. LAEC SAVED are in 10^6 \$/yr. Data under the headings of CAPITL SAVING & ELECTRIC POWER were not used in this study.

Report 6.1 data for individual process plants is presented for the coal nocogeneration base case in Volume VI, Part 1 and for the oil nocogeneration base case in Part 2. For the coal nocogeneration base case the national savings for the 2-digit SIC industrial sector and "ALL" industry were calculated for each cogeneration ECS. The national emissions saved are given in 10^6 tons/yr and the fuel saved in quads/yr. These results are shown in Volume VI, Part 1 for the coal nocogeneration base case and in Volume VI, Part 2 for the residual nocogeneration base case.

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15. Supplementary Notes

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16. Abstract

Large savings can be made in industry by cogenerating electric power and process heat in single energy conversion systems rather than separately in utility plants and in process boilers. This study examines the use of various advanced energy conversion systems and compares them with each other and with current technology systems for their savings in fuel energy, costs, and emissions in individual plants and on a national level.

About fifty industrial processes from the largest energy consuming sectors were used as a basis for matching a similar number of energy conversion systems that are considered as candidate which can be made available by the 1985 to 2000 time period. The sectors considered included food, textiles, lumber, paper, chemicals, petroleum, glass, and primary metals. The energy conversion systems included steam and gas turbines, diesels, thermionics, stirling, closed-cycle and steam injected gas turbines, and fuel cells. Fuels considered were coal, both coal and petroleum-based residual and distillate liquid fuels, and low Btu gas obtained through the on-site gasification of coal. An attempt was made to use consistent assumptions and a consistent set of groundrules specified by NASA for determining performance and cost.

Volume VI contains computer generated reports of the fuel consumption and savings, capital costs, economics and emissions of the cogeneration energy conversion systems (ECS's) heat and power matched to the individual industrial processes. National fuel and emissions savings are also reported for each ECS assuming it alone is implemented. Two nocogeneration base cases are included: coal-fired and residual-fired process boilers.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
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COAL-FIRED NOCOGENERATION PROCESS BOILER

REPORT 5.1 - FUEL ENERGY SAVED BY PROCESS
& ECS

DATE 06/06/79 GENERAL ELECTRIC COMPANY PAGE 1

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10101 MW 10.00 PROCESS MILLIONS BTU/HR 137.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR*1 HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.249

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 118. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**5 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	118.	0.	0.	0.	0.	0.	161.	107.	161.	COAL-FGD	268.	0	0.	0.13	0.51
1 STM141 STM-TURB-1 POWR	118.	65.	203.	138.	34.	10.	-2.	0.	203.	RESIDUAL	203.	0	0.43	0.17	0.68
1 STM141 STM-TURB-1 HEAT	118.	66.	201.	137.	34.	10.	0.	1.	201.	RESIDUAL	202.	0	0.44	0.17	0.68
1 STM141 STM-TURB-1 POWR	118.	65.	203.	138.	34.	10.	-2.	0.	203.	COAL-FGD	203.	0	0.43	0.17	0.68
1 STM141 STM-TURB-1 HEAT	118.	66.	201.	137.	34.	10.	0.	1.	201.	COAL-FGD	202.	0	0.44	0.17	0.68
1 STM141 STM-TURB-1 POWR	118.	65.	203.	138.	34.	10.	-2.	0.	203.	COAL-AFB	203.	0	0.43	0.17	0.68
1 STM141 STM-TURB-1 HEAT	118.	66.	201.	137.	34.	10.	0.	1.	201.	COAL-AFB	202.	0	0.44	0.17	0.68
2 STM088 STM-TURB-8 POWR	118.	13.	254.	182.	34.	10.	-53.	0.	254.	RESIDUAL	254.	0	0.09	0.13	0.54
2 STM088 STM-TURB-8 HEAT	118.	50.	191.	137.	26.	8.	0.	26.	191.	RESIDUAL	218.	0	0.33	0.12	0.63
2 STM088 STM-TURB-8 POWR	118.	13.	254.	182.	34.	10.	-53.	0.	254.	COAL-FGD	254.	0	0.09	0.13	0.54
2 STM088 STM-TURB-8 HEAT	118.	50.	191.	137.	26.	8.	0.	26.	191.	COAL-FGD	218.	0	0.33	0.12	0.63
2 STM088 STM-TURB-8 POWR	118.	13.	254.	182.	34.	10.	-53.	0.	254.	COAL-AFB	254.	0	0.09	0.13	0.54
2 STM088 STM-TURB-8 HEAT	118.	50.	191.	137.	26.	8.	0.	26.	191.	COAL-AFB	218.	0	0.33	0.12	0.63
3 PFBSTM PFB-STMTB- POWR	118.	66.	147.	90.	34.	10.	55.	0.	202.	COAL-PFB	202.	10	0.44	0.17	0.68
3 PFBSTM PFB-STMTB- HEAT	118.	100.	224.	137.	52.	15.	0.	-55.	224.	COAL-PFB	168.	0	0.48	0.23	0.61
4 TISTMT TI-STMTB-1 POWR	80.	65.	122.	69.	34.	10.	80.	0.	202.	RESIDUAL	202.	10	0.19	0.17	0.68
4 TISTMT TI-STMTB-1 HEAT	118.	35.	66.	37.	18.	5.	118.	49.	183.	RESIDUAL	233.	10	0.23	0.08	0.59
4 TISTMT TI-STMTB-1 POWR	118.	65.	122.	69.	34.	10.	80.	0.	202.	COAL	202.	10	0.44	0.17	0.68
4 TISTMT TI-STMTB-1 HEAT	118.	130.	243.	137.	68.	20.	0.	-106.	243.	COAL	137.	0	0.51	0.28	0.56
5 TIHRSG THERMIONIC POWR	0.	25.	243.	161.	34.	10.	-29.	0.	243.	RESIDUAL	243.	0	-0 62	0.14	0.56
5 TIHRSG THERMIONIC HEAT	118.	12.	56.	37.	8.	2.	118.	82.	173.	RESIDUAL	255.	10	0.08	0.03	0.54
5 TIHRSG THERMIONIC POWR	118.	25.	243.	161.	34.	10.	-29.	0.	243.	COAL	243.	0	0.17	0.14	0.56
5 TIHRSG THERMIONIC HEAT	118.	46.	206.	137.	29.	8.	0.	16.	206.	COAL	222.	0	0.31	0.13	0.62
6 STIRL STIRLING-1 POWR	92.	48.	128.	59.	34.	10.	92.	0.	220.	DISTILLA	220.	0	0.15	0.16	0.62
6 STIRL STIRLING-1 HEAT	118.	30.	80.	37.	21.	6.	118.	40.	198.	DISTILLA	238.	0	0.20	0.09	0.58

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR | REPORT 5.1

ORIGINAL PAGE IS OF POOR QUALITY

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10101 MW 10.00 PROCESS MILLIONS BTU/HR 137.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR*1 HOURS PER YEAR 8000.

POWER TO HEAT RATIO C.249

UTILITY FUEL COAL | WASTE FUEL EQV BTU*10**6= 118. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	92.	48.	128.	59.	34.	10.	92.	0.	220.	RESIDUAL	220.	0	0.15	0.16	0.62
6	STIRL	STIRLING-1	HEAT	118.	30.	80.	37.	21.	6.	118.	40.	198.	RESIDUAL	238.	0	0.20	0.09	0.58
6	STIRL	STIRLING-1	POWR	118.	48.	128.	59.	34.	10.	92.	0.	220.	COAL	220.	0	0.32	0.16	0.62
6	STIRL	STIRLING-1	HEAT	118.	112.	296.	137.	79.	23.	0.	-140.	296.	COAL	156.	0	0.38	0.27	0.46
7	HEGT85	HELIUM-GT-	POWR	118.	27.	106.	22.	34.	10.	135.	0.	241.	COAL-AFB	241.	10	0.18	0.14	0.57
7	HEGT85	HELIUM-GT-	HEAT	118.	163.	649.	137.	208.	61.	0.	-544.	649.	COAL-AFB	105.	0	0.24	0.32	0.21
8	HEGT60	HELIUM-GT-	POWR	118.	29.	132.	46.	34.	10.	107.	0.	239.	COAL-AFB	239.	10	0.19	0.14	0.57
8	HEGT60	HELIUM-GT-	HEAT	118.	86.	395.	137.	102.	30.	0.	-213.	395.	COAL-AFB	182.	10	0.24	0.26	0.35
9	HEGT00	HELIUM-GT-	POWR	118.	28.	194.	98.	34.	10.	46.	0.	240.	COAL-AFB	240.	10	0.19	0.14	0.57
9	HEGT00	HELIUM-GT-	HEAT	118.	39.	271.	137.	48.	14.	0.	-43.	271.	COAL-AFB	229.	10	0.20	0.18	0.50
10	FCMCCL	FUEL-CL-MO	POWR	0.	57.	112.	53.	34.	10.	98.	0.	211.	COAL	211.	10	-0.40	0.16	0.65
10	FCMCCL	FUEL-CL-MO	HEAT	0.	147.	289.	137.	88.	26.	0.	-168.	289.	COAL	121.	10	0.09	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	59.	86.	33.	34.	10.	123.	0.	208.	COAL	208.	10	-0.39	0.18	0.66
11	FCSTCL	FUEL-CL-ST	HEAT	0.	248.	359.	137.	143.	42.	0.	-339.	359.	COAL	20.	10	0.27	0.40	0.38
12	IGGTST	INT-GAS-GT	POWR	0.	48.	114.	46.	34.	10.	106.	0.	220.	COAL	220.	10	-0.47	0.16	0.62
12	IGGTST	INT-GAS-GT	HEAT	0.	141.	335.	137.	101.	29.	0.	-208.	335.	COAL	127.	10	0.06	0.30	0.41
13	GTSOAR	GT-HRSG-10	POWR	100.	50.	118.	52.	34.	10.	100.	0.	218.	RESIDUAL	218.	0	0.22	0.16	0.63
13	GTSOAR	GT-HRSG-10	HEAT	118.	36.	84.	37.	24.	7.	118.	31.	201.	RESIDUAL	232.	10	0.24	0.10	0.59
14	GTAC08	GT-HRSG-08	POWR	85.	56.	126.	65.	34.	10.	85.	0.	211.	RESIDUAL	211.	10	0.16	0.16	0.65
14	GTAC08	GT-HRSG-08	HEAT	118.	32.	72.	37.	20.	6.	118.	46.	190.	RESIDUAL	236.	10	0.21	0.08	0.58
15	GTAC12	GT-HRSG-12	POWR	100.	56.	112.	52.	34.	10.	100.	0.	211.	RESIDUAL	211.	10	0.25	0.16	0.65
15	GTAC12	GT-HRSG-12	HEAT	118.	40.	79.	37.	24.	7.	118.	31.	197.	RESIDUAL	228.	10	0.27	0.11	0.60
16	GTAC16	GT-HRSG-16	POWR	106.	56.	106.	47.	34.	10.	106.	0.	212.	RESIDUAL	212.	10	0.30	0.16	0.65
16	GTAC16	GT-HRSG-16	HEAT	118.	44.	84.	37.	27.	8.	118.	22.	202.	RESIDUAL	223.	10	0.30	0.12	0.61
17	GTWC16	GT-HRSG-16	POWR	110.	50.	108.	44.	34.	10.	110.	0.	218.	RESIDUAL	218.	10	0.28	0.16	0.63
17	GTWC16	GT-HRSG-16	HEAT	118.	42.	92.	37.	29.	8.	118.	16.	209.	RESIDUAL	226.	10	0.28	0.13	0.61

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10101 MW 10.00 PROCESS MILLIONS BTU/HR 137.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR#1 HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.249

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 118. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	118.	50.	88.	26.	34.	10.	130.	0.	218.	RESIDUAL	218.	10	0.33	0.16	0.63
18 CC1626 GTST-16/26 HEAT	118.	70.	124.	37.	48.	14.	118.	-44.	242.	RESIDUAL	198.	10	0.36	0.20	0.57
19 CC1622 GTST-16/22 POWR	118.	52.	89.	29.	34.	10.	127.	0.	216.	RESIDUAL	216.	10	0.35	0.16	0.64
19 CC1622 GTST-16/22 HEAT	118.	66.	113.	37.	43.	13.	118.	-29.	231.	RESIDUAL	202.	10	0.37	0.19	0.59
20 CC1222 GTST-12/22 POWR	118.	53.	88.	29.	34.	10.	127.	0.	215.	RESIDUAL	215.	10	0.35	0.16	0.64
20 CC1222 GTST-12/22 HEAT	118.	67.	112.	37.	43.	13.	118.	-29.	230.	RESIDUAL	201.	10	0.37	0.19	0.60
21 CC0822 GTST-08/22 POWR	118.	56.	93.	36.	34.	10.	118.	0.	212.	RESIDUAL	212.	10	0.37	0.16	0.65
21 CC0822 GTST-08/22 HEAT	118.	57.	95.	37.	35.	10.	118.	-2.	212.	RESIDUAL	211.	10	0.38	0.16	0.65
22 STIG15 STIG-15-16 POWR	118.	18.	90.	1.	34.	10.	160.	0.	249.	RESIDUAL	249.	10	0.12	0.14	0.55
22 STIG15 STIG-15-16 HEAT	118.	586.	2846.	37.	1084.	318.	118.	-3282.	2964.	RESIDUAL	-318.	0	0.17	0.37	0.05
23 STIG10 STIG-10-16 POWR	118.	26.	95.	13.	34.	10.	146.	0.	241.	RESIDUAL	241.	10	0.18	0.14	0.57
23 STIG10 STIG-10-16 HEAT	118.	78.	279.	37.	100.	29.	118.	-207.	397.	RESIDUAL	190.	0	0.22	0.25	0.35
24 STIGIS STIG-IS-16 POWR	118.	30.	102.	21.	34.	10.	136.	0.	238.	RESIDUAL	238.	10	0.20	0.14	0.58
24 STIGIS STIG-IS-16 HEAT	118.	52.	176.	37.	59.	17.	118.	-77.	293.	RESIDUAL	216.	10	0.23	0.20	0.47
25 DEADV3 DIESEL-ADV POWR	118.	40.	92.	21.	34.	10.	136.	0.	228.	RESIDUAL	228.	0	0.27	0.15	0.60
25 DEADV3 DIESEL-ADV HEAT	118.	69.	159.	37.	59.	17.	118.	-78.	277.	RESIDUAL	199.	0	0.30	0.21	0.50
26 DEADV2 DIESEL-ADV POWR	118.	42.	92.	23.	34.	10.	134.	0.	226.	RESIDUAL	226.	1	0.28	0.15	0.61
26 DEADV2 DIESEL-ADV HEAT	118.	67.	146.	37.	54.	16.	118.	-62.	263.	RESIDUAL	[illegible]	1	0.31	0.21	0.52
27 DEADV1 DIESEL-ADV POWR	118.	57.	92.	36.	34.	10.	119.	0.	211.	RESIDUAL	211.	1	0.38	[illegible]	0.65
27 DEADV1 DIESEL-ADV HEAT	118.	59.	95.	37.	35.	10.	118.	-3.	212.	RESIDUAL	[illegible]	1	0.38	0.17	0.65
28 DEHTPM ADV-DIESEL POWR	112.	59.	97.	42.	34.	10.	112.	0.	209.	RESIDUAL	209.	0	0.35	0.16	0.66
28 DEHTPM ADV-DIESEL HEAT	118.	52.	85.	37.	30.	9.	118.	13.	203.	RESIDUAL	216.	0	0.34	0.14	0.63
29 DESOA3 DIESEL-SOA POWR	118.	34.	95.	19.	34.	10.	139.	0.	234.	DISTILLA	234.	0	0.23	0.15	0.59
29 DESOA3 DIESEL-SOA HEAT	118.	67.	186.	37.	67.	20.	118.	-103.	304.	DISTILLA	200.	0	0.27	0.22	0.45
29 DESOA3 DIESEL-SOA POWR	118.	34.	95.	19.	34.	10.	139.	0.	234.	RESIDUAL	234.	0	0.23	0.15	0.59
29 DESOA3 DIESEL-SOA HEAT	118.	67.	186.	37.	67.	20.	118.	-103.	304.	RESIDUAL	200.	0	0.27	0.22	0.45

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10101 MW 10.00 PROCESS MILLIONS BTU/HR 137.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR*1 HOURS PER YEAR 6000.

POWER.TO HEAT RATIO 0.249

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 118. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	118.	37.	95.	21.	34.	10.	137.	0.	231.	DISTILLA	231.	1	0.24	0.15	0.59
30	DESCA2	DIESEL-SOA	HEAT	118.	65.	168.	37.	61.	18.	118.	-83.	286.	DISTILLA	203.	1	0.28	0.21	0.48
30	DESOA2	DIESEL-SOA	POWR	118.	37.	95.	21.	34.	10.	137.	0.	231.	RESIDUAL	231.	1	0.24	0.15	0.59
30	DESOA2	DIESEL-SOA	HEAT	118.	65.	168.	37.	61.	18.	118.	-83.	286.	RESIDUAL	203.	1	0.28	0.21	0.48
31	DESOA1	DIESEL-SOA	POWR	117.	57.	95.	38.	34.	10.	117.	0.	211.	DISTILLA	211.	1	0.37	0.16	0.65
31	DESOA1	DIESEL-SOA	HEAT	118.	55.	92.	37.	33.	10.	118.	3.	210.	DISTILLA	212.	1	0.37	0.16	0.64
31	DESOA1	DIESEL-SOA	POWR	117.	57.	95.	38.	34.	10.	117.	0.	211.	RESIDUAL	211.	1	0.37	0.16	0.65
31	DESOA1	DIESEL-SOA	HEAT	118.	55.	92.	37.	33.	10.	118.	3.	210.	RESIDUAL	212.	1	0.37	0.16	0.64
32	GTSOAD	GT-HRSG-10	POWR	97.	54.	117.	55.	34.	10.	97.	0.	214.	DISTILLA	214.	10	0.22	0.16	0.64
32	GTSOAD	GT-HRSG-10	HEAT	118.	37.	79.	37.	23.	7.	118.	35.	197.	DISTILLA	231.	10	0.24	0.10	0.59
33	GTRA08	GT-85RE-08	POWR	118.	52.	96.	35.	34.	10.	121.	0.	216.	DISTILLA	216.	10	0.34	0.16	0.6[illegible]
33	GTRA08	GT-85RE-08	HEAT	118.	55.	102.	37.	37.	11.	118.	-8.	220.	DISTILLA	212.	10	0.35	0.17	0.62
34	GTRA12	GT-85RE-12	POWR	118.	53.	95.	35.	34.	10.	120.	0.	21[illegible].	DISTILLA	215.	10	0.35	0.16	0.64
34	GTRA12	GT-85RE-12	HEAT	118.	55.	101.	37.	36.	11.	118.	-6.	21[illegible].	DISTILLA	212.	10	0.36	0.17	0.63
35	GTRA16	GT-85RE-16	POWR	117.	53.	98.	37.	34.	10.	117.	0.	215.	DISTILLA	215.	10	0.35	0.16	0.64
35	GTRA16	GT-85RE-16	HEAT	118.	52.	97.	37.	34.	10.	118.	1.	215.	DISTILLA	215.	10	0.35	0.16	0.64
36	GTR208	GT-60RE-08	POWR	109.	52.	107.	45.	34.	10.	109.	0	215.	DISTILLA	215.	10	0.29	0.16	0.64
36	GTR208	GT-60RE-08	HEAT	118.	44.	89.	37.	28.	8.	118.	18.	206.	DISTILLA	224.	10	0.29	0.13	0.61
37	GTR212	GT [illegible]ORE-12	POWR	112.	52.	103.	4[illegible].	34.	10.	112.	0.	216.	DISTILLA	216.	10	0.31	0.16	0.63
37	GTR212	GT-[illegible]ORE-12	HEAT	118.	46.	92.	37.	30.	9.	118.	12.	210.	DISTILLA	221.	10	0.31	0.14	0.62
38	GTR216	GT-60RE-16	POWR	113.	53.	101.	41.	34.	10.	113.	0.	215.	DISTILLA	215.	10	0.[illegible]3	0.16	0.64
38	GTR216	GT-60RE-16	HEAT	118.	48.	92.	37.	31.	9.	118.	9.	210.	DISTILLA	219.	10	0.32	0.14	0.62
39	GTRW08	GT-85RE-08	POWR	118.	43.	97.	29.	34.	10.	127.	0.	225.	DISTILLA	225.	10	0.29	0.15	0.61
39	GTRW08	GT-85RE-08	HEAT	118.	56.	125.	37.	44.	13.	118.	-30.	243.	DISTILLA	212.	10	0.31	0.18	0.56
40	GTRW12	GT-85RE-12	POWR	118.	46.	94.	28.	34.	10.	128.	0.	222.	DISTILLA	222.	10	0.31	0.15	0.62
40	GTRW12	GT-85RE-12	HEAT	118.	61.	124.	37.	45.	13.	118.	-34.	241.	DISTILLA	207.	10	0.33	0.19	0.57

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10101 MW 10.00 PROCESS MILLIONS BTU/HR 137.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR#1 HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.249

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 118. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	118.	46.	96.	30.	34.	10.	126.	0.	221.	DISTILLA	221.	10	0.31	0.15	0.62
41 GTRW16 GT-85RE-16 HEAT	118.	57.	113.	37.	42.	12.	118.	-25.	236.	DISTILLA	211.	10	0.33	0.18	0.58
42 GTR308 GT-60RE-08 POWR	117.	41.	110.	38.	34.	10.	117.	0.	227.	DISTILLA	227.	10	0.27	0.15	0.60
42 GTR308 GT-60RE-08 HEAT	118.	40.	108.	37.	33.	10.	118.	2.	225.	DISTILLA	228.	10	0.27	0.15	0.60
43 GTR312 GT-60RE-12 POWR	118.	47.	100.	34.	34.	10.	121.	0.	221.	DISTILLA	221.	10	0.31	0.15	0.62
43 GTR312 GT-60RE-12 HEAT	118.	51.	109.	37.	37.	11.	118.	-10.	226.	DISTILLA	217.	10	0.32	0.16	0.61
44 GTR316 GT-60RE-16 POWR	118.	47.	101.	34.	34.	10.	121.	0.	221.	DISTILLA	221.	10	0.31	0.15	0.62
44 GTR316 GT-60RE-16 HEAT	118.	50.	108.	37.	37.	11.	118.	-8.	226.	DISTILLA	218.	10	0.32	0.16	0.61
45 FCPADS FUEL-CL-PH POWR	118.	35.	90.	15.	34.	10.	143.	0.	233.	DISTILLA	233.	0	0.23	0.15	0.59
45 FCPADS FUEL-CL-PH HEAT	118.	84.	218.	37.	83.	24.	118.	-152.	335.	DISTILLA	183.	0	0.28	0.25	0.41
46 FCMCDS FUEL-CL-MO POWR	118.	47.	83.	19.	34.	10.	138.	0.	221.	DISTILLA	221.	0	0.31	0.15	0.62
46 FCMCDS FUEL-CL-MO HEAT	118.	89.	159.	37.	65.	19.	118.	-98.	276.	DISTILLA	179.	0	0.36	0.24	0.50

HONEYWELL PAGE PRINTING SYSTEM- P1185-02

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10102 MW 30.00 PROCESS MILLIONS BTU/HR 410.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR#2 HOURS PER YEAR 5000.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	482.	320.	482.	COAL-FGD	802.	0	0.	0.13	0.51
1 STM141 STM-TURB-1 POWR	0.	194.	609.	415.	102.	30.	-6.	0.	609.	RESIDUAL	609.	0	0.24	0.17	0.67
1 STM141 STM-TURB-1 HEAT	0.	197.	601.	410.	101.	30.	0.	4.	601.	RESIDUAL	605.	0	0.25	0.17	0.68
1 STM141 STM-TURB-1 POWR	0.	194.	609.	415.	102.	30.	-6.	0.	609.	COAL-FGD	609.	0	0.24	0.17	0.67
1 STM141 STM-TURB-1 HEAT	0.	197.	601.	410.	101.	30.	0.	4.	601.	COAL-FGD	605.	0	0.25	0.17	0.68
1 STM141 STM-TURB-1 POWR	0.	194.	609.	415.	102.	30.	-6.	0.	609.	COAL-AFB	609.	0	0.24	0.17	0.67
1 STM141 STM-TURB-1 HEAT	0.	197.	601.	410.	101.	30.	0.	4.	601.	COAL-AFB	605.	0	0.25	0.17	0.68
2 STM088 STM-TURB-8 POWR	0.	39.	763.	546.	102.	30.	-160.	0.	763.	RESIDUAL	763.	0	0.05	0.13	0.54
2 STM088 STM-TURB-8 HEAT	0.	150.	573.	410.	77.	23.	0.	80.	573.	RESIDUAL	653.	0	0.19	0.12	0.63
2 STM088 STM-TURB-8 POWR	0.	39.	763.	546.	102.	30.	-160.	0.	763.	COAL-FGD	763.	0	0.05	0.13	0.54
2 STM088 STM-TURB-8 HEAT	0.	150.	573.	410.	77.	23.	0.	80.	573.	COAL-FGD	653.	0	0.19	0.12	0.63
2 STM088 STM-TURB-8 POWR	0.	39.	763.	546.	102.	30.	-160.	0.	763.	COAL-AFB	763.	0	0.05	0.13	0.54
2 STM088 STM-TURB-8 HEAT	0.	150.	573.	410.	77.	23.	0.	80.	573.	COAL-AFB	653.	0	0.19	0.12	0.63
3 PFBSTM PFB-STMTB- POWR	0.	197.	442.	271.	102.	30.	164.	0.	606.	COAL-PFB	606.	0	0.25	0.17	0.68
3 PFBSTM PFB-STMTB- HEAT	0.	298.	669.	410.	155.	45.	0.	-165.	669.	COAL-PFB	504.	0	0.31	0.23	0.61
4 TISTMT TI-STMTB-1 POWR	0.	196.	366.	206.	102.	30.	240.	0.	606.	RESIDUAL	606.	0	0.24	0.17	0.68
4 TISTMT TI-STMTB-1 HEAT	0.	391.	728.	410.	203.	60.	0.	-316.	728.	RESIDUAL	412.	0	0.35	0.28	0.56
4 TISTMT TI-STMTB-1 POWR	0.	196.	366.	206.	102.	30.	240.	0.	606.	COAL	606.	0	0.24	0.17	0.68
4 TISTMT TI-STMTB-1 HEAT	0.	391.	728.	410.	203.	60.	0.	-316.	728.	COAL	412.	0	0.35	0.28	0.56
5 TIHRSG THERMIONIC POWR	0.	75.	728.	484.	102.	30.	-88.	0.	728.	RESIDUAL	728.	0	0.09	0.14	0.56
5 TIHRSG THERMIONIC HEAT	0.	137.	616.	410.	87.	25.	0.	49.	616.	RESIDUAL	665.	0	0.17	0.13	0.62
5 TIHRSG THERMIONIC POWR	0.	75.	728.	484.	102.	30.	-88.	0.	728.	COAL	728.	0	0.09	0.14	0.56
5 TIHRSG THERMIONIC HEAT	0.	137.	616.	410.	87.	25.	0.	49.	616.	COAL	665.	0	0.17	0.13	0.62
6 STIRL STIRLING-1 POWR	0.	145.	384.	177.	102.	30.	274.	0.	657.	DISTILLA	657.	0	0.18	0.16	0.62
6 STIRL STIRLING-1 HEAT	0.	335.	887.	410.	237.	69.	0.	-419.	887.	DISTILLA	468.	0	0.27	0.27	0.46

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10102 MW 30.00 PROCESS MILLIONS BTU/HR 410.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR#2 HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NLT 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	145.	384.	177.	102.	30.	274.	0.	657.	RESIDUAL	657.	0	0.18	0.16	0.62
6	STIRL	STIRLING-1	HEAT	0.	335.	887.	410.	237.	69.	0.	-419.	887.	RESIDUAL	468.	0	0.27	0.27	0.46
6	STIRL	STIRLING-1	POWR	0.	145.	384.	177.	102.	30.	274.	0.	657.	COAL	657.	0	0.18	0.16	0.62
6	STIRL	STIRLING-1	HEAT	0.	335.	887.	410.	237.	69.	0.	-419.	887.	COAL	468.	0	0.27	0.27	0.46
7	HEGT85	HELIUM-GT-	POWR	0.	80.	319.	67.	102.	30.	403.	0.	722.	COAL-AFB	722.	10	0.10	0.14	0.57
7	HEGT85	HELIUM-GT-	HEAT	0.	488.	1941	410.	623.	183.	0.	-1627.	1941.	COAL-AFB	314.	0	0.20	0.32	0.21
8	HEGT60	HELIUM-GT-	POWR	0.	86.	395.	137.	102.	30.	321.	0.	716.	COAL-AFB	716.	10	0.11	0.14	0.57
8	HEGT60	HELIUM-GT-	HEAT	0.	257.	1183.	410.	306.	90.	0.	-638.	1183.	COAL-AFB	545.	0	0.18	0.26	0.35
9	HEGT00	HELIUM-GT-	POWR	0.	84.	582.	294.	102.	30.	137.	0.	719.	COAL-AFB	719.	10	0.10	0.14	0.57
9	HEGT00	HELIUM-GT-	HEAT	0.	117.	812.	410.	143.	42.	0.	-127.	812.	COAL-AFB	685.	10	0.13	0.18	0.50
10	FCMCCL	FUEL-CL-MO	POWR	0.	171.	337.	160.	102.	30.	294.	0.	631.	COAL	631.	10	0.21	0.16	0.65
10	FCMCCL	FUEL-CL-MO	HEAT	0.	439.	864.	410.	263.	77.	0.	-501.	864.	COAL	363.	10	0.34	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	178.	258.	98.	102.	30.	367.	0.	624.	COAL	624.	10	0.22	0.16	0.66
11	FCSTCL	FUEL-CL-ST	HEAT	0.	742.	1074.	410.	427.	125.	0.	-1013.	1074.	COAL	60.	0	0.41	0.40	0.38
12	IGGTST	INT-GAS-GT	POWR	0.	143.	341.	139.	102.	30.	318.	0.	659.	COAL	659.	10	0.18	0.16	0.62
12	IGGTST	INT-GAS-GT	HEAT	0.	421.	1001.	410.	301.	88.	0.	-621.	1001.	COAL	381.	0	0.30	0.30	0.41
13	GTSOAR	GT-HRSG-10	POWR	0.	151.	353.	156.	102.	30.	299.	0.	652.	RESIDUAL	652.	0	0.19	0.16	0.63
13	GTSOAR	GT-HRSG-10	HEAT	0.	396.	926.	410.	269.	79.	0.	-520.	926.	RESIDUAL	407.	0	0.30	0.29	0.44
14	GTAC08	GT-HRSG-08	POWR	0.	169.	379.	194.	102.	30.	254.	0.	633.	RESIDUAL	633.	0	0.21	0.16	0.65
14	GTAC08	GT-HRSG-08	HEAT	0.	357.	801.	410.	216.	63.	0.	-356.	801.	RESIDUAL	445.	0	0.31	0.27	0.51
15	GTAC12	GT-HRSG-12	POWR	0.	169.	336.	157.	102.	30.	298.	0.	633.	RESIDUAL	633.	0	0.21	0.16	0.65
15	GTAC12	GT-HRSG-12	HEAT	0.	441.	876.	410.	267.	78.	0.	-515.	876.	RESIDUAL	361	0	0.33	0.31	0.47
16	GTAC16	GT-HRSG-16	POWR	0.	167.	317.	140.	102.	30.	318.	0.	635.	RESIDUAL	635.	0	0.21	0.16	0.65
16	GTAC16	GT-HRSG-16	HEAT	0.	491.	929.	410.	300.	88.	0.	-618.	929.	RESIDUAL	311.	0	0.35	0.32	0.44
17	GTWC16	GT-HRSG-16	POWR	0.	149.	325.	131.	102.	30.	328.	0.	653.	RESIDUAL	653.	0	0.19	0.16	0.63
17	GTWC16	GT-HRSG-16	HEAT	0.	466.	1015.	410.	320.	94.	0.	-679.	1015.	RESIDUAL	336.	0	0.31	0.32	0.40

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10102 MW 30.00 PROCESS MILLIONS BTU/HR 410.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR#2 HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0: HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	149.	263.	79.	102.	30.	390.	0.	653.	RESIDUAL	653.	0	0.19	0.16	0.63
18 CC1626 GTST-16/26 HEAT	0.	778.	1373.	410.	534.	157.	0.	-1349.	1373.	RESIDUAL	24.	0	0.36	0.39	0.30
19 CC1622 GTST-16/22 POWR	0.	156.	266.	87.	102.	30.	380.	0.	646.	RESIDUAL	646.	0	0.19	0.16	0.63
19 CC1622 GTST-16/22 HEAT	0.	735.	1251.	410.	481.	141.	0.	-1183.	1251.	RESIDUAL	68.	0	0.37	0.38	0.33
20 CC1222 GTST-12/22 POWR	0.	158.	265.	88.	102.	30.	379.	0.	644.	RESIDUAL	644.	0	0.20	0.16	0.64
20 CC1222 GTST-12/22 HEAT	0.	739.	1242.	410.	479.	141.	0.	-1179.	1242.	RESIDUAL	63.	0	0.37	0.39	0.33
21 CC0822 GTST-08/22 POWR	0.	169.	279.	109.	102.	30.	354.	0.	633.	RESIDUAL	633.	0	0.21	0.16	0.65
21 CC0822 GTST-08/22 HEAT	0.	634.	1049.	410.	384.	113.	0.	-881.	1049.	RESIDUAL	168.	0	0.38	0.37	0.39
22 STIG15 STIG-15-16 POWR	0.	55.	269.	3.	102.	30.	478.	0.	747.	RESIDUAL	747.	0	0.07	0.14	0.55
22 STIG15 STIG-15-16 HEAT	0.	6494.	31538.	410.	12016.	3522.	0.	-37231.	31538.	RESIDUAL	-5692.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	79.	285.	38.	102.	30.	438.	0.	723.	RESIDUAL	723.	0	0.10	0.14	0.57
23 STIG10 STIG-10-16 HEAT	0.	860.	3094.	410.	1111.	326.	0.	-3153.	3094.	RESIDUAL	-58.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	90.	305.	64.	102.	30.	407.	0.	712.	RESIDUAL	712.	0	0.11	0.14	0.58
24 STIG1S STIG-1S-16 HEAT	0.	575.	1945.	410.	652.	191.	0.	-1717.	1945.	RESIDUAL	227.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	120.	276.	64.	102.	30.	407.	0.	683.	RESIDUAL	683.	0	0.15	0.15	0.60
25 DEADV3 DIESEL-ADV HEAT	0.	763.	1760.	410.	653.	191.	0.	-1721.	1760.	RESIDUAL	39.	0	0.30	0.37	0.23
26 DEADV2 DIESEL-ADV POWR	0.	126.	276.	70.	102.	30.	400.	0.	676.	RESIDUAL	676.	1	0.16	0.15	0.61
26 DEADV2 DIESEL-ADV HEAT	0.	740.	1614.	410.	599.	176.	0.	-1552.	1614.	RESIDUAL	63.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	171.	276.	108.	102.	30.	355.	0.	631.	RESIDUAL	631.	1	0.21	0.16	0.65
27 DEADV1 DIESEL-ADV HEAT	0.	649.	1049.	410.	389.	114.	0.	-896.	1049.	RESIDUAL	153.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	177.	292.	127.	102.	30.	333.	0.	626.	RESIDUAL	626.	0	0.22	0.16	0.66
28 DEHTPM ADV-DIESEL HEAT	0.	572.	947.	410.	332.	97.	0.	-716.	947.	RESIDUAL	230.	0	0.38	0.35	0.43
29 DESOA3 DIESEL-SOA POWR	0.	103.	284.	56.	102.	30.	416.	0.	700.	DISTILLA	700.	0	0.13	0.15	0.59
29 DESOA3 DIESEL-SOA HEAT	0.	746.	2061.	410.	744.	218.	0.	-2006.	2061.	DISTILLA	56.	0	0.27	0.36	0.20
29 DESOA3 DIESEL-SOA POWR	0.	103.	284.	56.	102.	30.	416.	0.	700.	RESIDUAL	700.	0	0.13	0.15	0.59
29 DESOA3 DIESEL-SOA HEAT	0.	746.	2061.	410.	744.	218.	0.	-2006.	2061.	RESIDUAL	56.	0	0.27	0.36	0.20

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10102 MW 30.00 PROCESS MILLIONS BTU/HR 410.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR*2 HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	110.	284.	62.	102.	30.	409.	0.	693.	DISTILLA	693.	1	0.14	0.15	0.59
30	DESOA2	DIESEL-SOA	HEAT	0.	721.	1864.	410.	673.	197.	0.	-1783.	1864.	DISTILLA	81.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	110.	284.	62.	102.	30.	409	0.	693.	RESIDUAL	693.	1	0.14	0.15	0.59
30	DESOA2	DIESEL-SOA	HEAT	0.	721.	1864.	410.	673.	197.	0.	-1783.	1864.	RESIDUAL	81.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	170.	284.	114.	102.	30.	349.	0.	632.	DISTILLA	632.	1	0.21	0.16	0.65
31	DESOA1	DIESEL-SOA	HEAT	0.	613.	1022.	410.	369.	108.	0.	-834.	1022.	DISTILLA	189.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	170.	284.	114.	102.	30.	349.	0.	632.	RESIDUAL	632.	1	0.21	0.16	0.65
31	DESOA1	DIESEL-SOA	HEAT	0.	613.	1022.	410.	369.	108.	0.	-834.	1022.	RESIDUAL	189.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	163.	351.	164.	102.	30.	289.	0.	640.	DISTILLA	640.	0	0.20	0.16	0.64
32	GTSOAD	GT-HRSG-10	HEAT	0.	406.	875.	410.	256.	75.	0.	-479.	875.	DISTILLA	396.	0	0.32	0.29	0.47
33	GTRA08	GT-85RE-08	POWR	0.	155.	287.	104.	102.	30.	360.	0.	647.	DISTILLA	647.	0	0.19	0.16	0.63
33	GTRA08	GT-85RE-08	HEAT	0.	614.	1134.	410.	405.	119.	0.	-946.	1134.	DISTILLA	189.	0	0.35	0.35	0.36
34	GTRA12	GT-85RE-12	POWR	0.	158.	286.	105.	102.	30.	359.	0.	645.	DISTILLA	645.	0	0.20	0.16	0.64
34	GTRA12	GT-85RE-12	HEAT	0.	615.	1115.	410.	399.	117.	0.	-928.	1115.	DISTILLA	187.	0	0.36	0.36	0.37
35	GTRA16	GT-85RE-16	POWR	0.	158.	293.	112.	102.	30.	351.	0.	644.	DISTILLA	644.	0	0.20	0.16	0.64
35	GTRA16	GT-85RE-16	HEAT	0.	580.	1075.	410.	375.	110.	0.	-853.	1075.	DISTILLA	222.	0	0.35	0.35	0.38
36	GTR208	GT-60RE-08	POWR	0.	157.	320.	134.	102.	30.	325.	0.	645.	DISTILLA	645.	0	0.20	0.16	0.64
36	GTR208	GT-60RE-08	HEAT	0.	482.	982.	410.	314.	92.	0.	-662.	982.	DISTILLA	320.	0	0.33	0.32	0.42
37	GTR212	GT-60RE-12	POWR	0.	156.	310.	124.	102.	30.	336.	0.	646.	DISTILLA	646.	0	0.19	0.16	0.63
37	GTR212	GT-60RE-12	HEAT	0.	514.	1022.	410.	337.	99.	0.	-734.	1022.	DISTILLA	288.	0	0.33	0.33	0.40
38	GTR216	GT-60RE-16	POWR	0.	159.	304.	122.	102.	30.	339.	0.	643.	DISTILLA	643.	0	0.20	0.16	0.64
38	GTR216	GT-60RE-16	HEAT	0	537.	1024.	410.	345.	101.	0.	-759.	1024.	DISTILLA	265.	0	0.34	0.34	0.40
39	GTRW08	GT-85RE-08	POWR	0.	130.	292.	86	102.	30.	381.	0.	672.	DISTILLA	672.	0	0.16	0.15	0.61
39	GTRW08	GT-85RE-08	HEAT	0.	617.	1385.	410.	486.	142	0.	-1199.	1385.	DISTILLA	186.	0	0.31	0.35	0.30
40	GTRW12	GT-85RE-12	POWR	0.	138.	281.	84.	102.	30.	383.	0.	665.	DISTILLA	665.	0	0.17	0.15	0.62
40	GTRW12	GT-85RE-12	HEAT	0.	671.	1370.	410.	499.	146.	0.	-1239.	1370.	DISTILLA	131.	0	0.33	0.36	0.30

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 10102 MW 30.00 PROCESS MILLIONS BTU/HR 410.0 PROCESS TEMP(F) 300. PRODUCT NASA-CLBR#2 HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL.+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	GTRW16	GT-85RE-16	POWR	0.	139.	287.	90.	102.	30.	376.	0.	663.	DISTILLA	663.	0	0.17	0.15	0.62
41	GTRW16	GT-85RE-16	HEAT	0.	633.	1306.	410.	466.	137.	0.	-1137.	1306.	DISTILLA	169.	0	0.33	0.36	0.31
42	GTR308	GT-60RE-08	POWR	0.	123.	330.	113.	102.	30.	349.	0.	679.	DISTILLA	679.	0	0.15	0.15	0.60
42	GTR308	GT-60RE-08	HEAT	0.	445.	1193.	410.	370.	108.	0.	-836.	1193.	DISTILLA	357.	0	0.27	0.31	0.34
43	GTR312	GT-60RE-12	POWR	0.	140.	299.	102.	102.	30.	363.	0.	662.	DISTILLA	662.	0	0.17	0.15	0.62
43	GTR312	GT-60RE-12	HEAT	0.	565.	1205.	410.	412.	121.	0.	-968.	1205.	DISTILLA	237.	0	0.32	0.34	0.34
44	GTR316	GT-60RE-16	POWR	0.	140.	302.	103.	102.	30.	361.	0.	663.	DISTILLA	663.	0	0.17	0.15	0.62
44	GTR316	GT-60RE-16	HEAT	0.	553.	1198.	410.	406.	119.	0.	-949.	1196.	DISTILLA	249.	0	0.32	0.34	0.34
45	FCPADS	FUEL-CL-PH	POWR	0.	104.	269.	46.	102.	30.	428.	0.	698.	DISTILLA	698.	0	0.13	0.15	0.59
45	FCPADS	FUEL-CL-PH	HEAT	0.	935.	2412.	410.	916.	269.	0.	-2544.	2412.	DISTILLA	-132.	0	0.28	0.38	0.17
46	FCMCDS	FUEL-CL-MO	POWR	0.	140.	248.	58.	102.	30.	414.	0.	663.	DISTILLA	663.	0	0.17	0.15	0.62
46	FCMCDS	FUEL-CL-MO	HEAT	0.	988.	1760.	410.	725.	212.	0.	-1946.	1760.	DISTILLA	-186.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20111 MW 1.94 PROCESS MILLIONS BTU/HR 24.0 PROCESS TEMP(F) 250. PRODUCT MEAT-PACKING HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.276

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 10.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	28.	21.	28.	RESIDUAL	49.	0	0.	0.14	0.49
1 STM141 STM-TURB-1 POWR	0.	13.	34.	22.	7.	2.	2.	0.	36.	RESIDUAL	36.	10	0.26	0.18	0.67
1 STM141 STM-TURB-1 HEAT	0.	14.	37.	24.	7.	2.	0.	-2.	37.	RESIDUAL	35.	10	0.28	0.20	0.65
1 STM141 STM-TURB-1 POWR	0.	13.	34.	22.	7.	2.	2.	0.	36.	COAL-FGD	36.	10	0.26	0.18	0.67
1 STM141 STM-TURB-1 HEAT	0.	14.	37.	24.	7.	2.	0.	-2.	37.	COAL-FGD	35.	10	0.28	0.20	0.65
1 STM141 STM-TURB-1 POWR	0.	13.	34.	22.	7.	2.	2.	0.	36.	COAL-AFB	36.	10	0.26	0.18	0.67
1 STM141 STM-TURB-1 HEAT	0.	14.	37.	24.	7.	2.	0.	-2.	37.	COAL-AFB	35.	10	0.28	0 20	0.65
2 STM088 STM-TURB-8 POWR	0.	8.	41.	28.	7.	2.	-5.	0.	41.	RESIDUAL	41.	10	0.17	0.16	0.59
2 STM088 STM-TURB-8 HEAT	0.	11.	35.	24.	6.	2.	0.	3.	35.	RESIDUAL	38.	10	0.23	0.15	0.63
2 STM088 STM-TURB-8 POWR	0.	8.	41.	28.	7.	2.	-5.	0.	41.	COAL-FGD	41.	10	0.17	0.16	0.59
2 STM088 STM-TURB-8 HEAT	0.	11.	35.	24.	6.	2.	0.	3.	35.	COAL-FGD	38.	10	0.23	0.15	0.63
2 STM088 STM-TURB-8 POWR	0.	8.	41.	28.	7.	2.	-5.	0.	41.	COAL-AFB	41.	10	0.17	0.16	0.59
2 STM088 STM-TURB-8 HEAT	0.	11.	35.	24.	6.	2.	0.	3.	35.	COAL-AFB	38.	10	0.23	0.15	0.63
3 PFBSTM PFB-STMTB- POWR	0.	13.	26.	15.	7.	2.	10.	0.	36.	COAL-PFB	36.	10	0.26	0.18	0.66
3 PFBSTM PFB-STMTB- HEAT	0.	20.	41.	24.	10.	3.	0.	-12.	41.	COAL-PFB	29.	10	0.33	0.26	0.59
4 TISTMT TI-STMTB-1 POWR	0.	13.	22.	12.	7.	2.	14.	0.	36.	RESIDUAL	36.	10	0.26	0.18	0.66
4 TISTMT TI-STMTB-1 HEAT	0.	26.	44.	24	13.	4.	0.	-21.	44.	RESIDUAL	23.	10	0.37	0.30	0.54
4 TISTMT TI-STMTB-1 POWR	0.	13.	22.	12.	7.	2.	14.	0.	36.	COAL	36.	10	0.26	0.18	0.66
4 TISTMT TI-STMTB-1 HEAT	0.	26.	44.	24.	13.	4.	0.	-21.	44.	COAL	23.	10	0.37	0.30	0.54
5 TIHRSG THERMIONIC POWR	0.	2.	47.	32.	7.	2.	-9.	0.	47.	RESIDUAL	47.	10	0.04	0.14	0.51
5 TIHRSG THERMIONIC HEAT	0.	8.	35.	24.	5.	1.	0.	5.	35.	RESIDUAL	41.	10	0.17	0.12	0.59
5 TIHRSG THERMIONIC POWR	0.	2.	47.	32.	7.	2.	-9.	0.	47.	COAL	47.	10	0.04	0.14	0.51
5 TIHRSG THERMIONIC HEAT	0.	8.	35.	24.	5.	1.	0.	5.	35.	COAL	41.	10	0.17	0.12	0.59
6 STIRL STIRLING-1 POWR	0.	10.	22.	10.	7.	2.	17.	0.	38.	DISTILLA	38.	0	0.21	0.17	0.62
6 STIRL STIRLING-1 HEAT	0.	25.	53.	24.	16.	5.	0.	-29.	53.	DISTILLA	24.	0	0.32	0.30	0.43

HONEYWELL PAGE PRINTING SYSTEM

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20111 MW 1.94 PROCESS MILLIONS BTU/HR 24.0 PROCESS TEMP(F) 250. PRODUCT MEAT-PACKING HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.276

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 10.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	10.	22.	10.	7.	2.	17.	0.	38.	RESIDUAL	38.	0	0.21	0.17	0.62
6	STIRL	STIRLING-1	HEAT	0.	25.	53.	24.	16.	5.	0.	-29.	53.	RESIDUAL	24.	0	0.32	0.30	0.45
6	STIRL	STIRLING-1	POWR	0.	10.	22.	10.	7.	2.	17.	0.	38.	COAL	38.	0	0.21	0.17	0.62
6	STIRL	STIRLING-1	HEAT	0.	25.	53.	24.	16.	5.	0.	-2[illegible]	53.	COAL	24.	0	0.32	0.30	0.45
7	HEGT85	HELIUM-GT-	POWR	0.	9.	21.	8.	7.	2.	19.	[illegible]	40.	COAL-AFB	40.	10	0.19	0.17	0.60
7	HEGT85	HELIUM-GT-	HEAT	0.	28.	64.	24.	21.	6.	0.	-4[illegible]	[illegible]4.	COAL-AFB	20.	10	0.31	0.32	0.38
8	HEGT60	HELIUM-GT-	POWR	0.	7.	26.	10.	7.	2.	17.	0.	42.	COAL-AFB	42.	10	0.13	0.16	0.57
8	HEGT60	HELIUM-GT-	HEAT	0.	16.	63.	24.	16.	5.	0.	-30.	63.	COAL-AFB	33.	10	0.20	0.26	0.38
9	HEGT00	HELIUM-GT-	POWR	0.	6.	38.	20.	7.	2.	5.	0.	43.	COAL-AFB	43.	10	0.12	0.15	0.56
9	HEGT00	HELIUM-GT-	HEAT	0.	7.	46.	24.	8.	2.	0.	-5.	46.	COAL-AFB	42.	10	0.14	0.18	0.52
10	FCMCCL	FUEL-CL-MO	POWR	0.	11.	22.	10.	7.	2.	16.	0.	38.	COAL	38.	10	0.23	0.17	0.63
10	FCMCCL	FUEL-CL-MO	HEAT	0.	26.	50.	24.	15.	4.	0.	-27.	50.	COAL	23.	10	0.34	0.30	0.48
11	FCSTCL	FUEL-CL-ST	POWR	0.	12.	16.	6.	7.	2.	21.	0.	37.	COAL	37.	10	0.24	0.18	0.64
11	FCSTCL	FUEL-CL-ST	HEAT	0.	47.	66.	24.	27.	8.	0.	-64.	66.	COAL	2.	10	0.42	0.41	0.37
12	IGGTST	INT-GAS-GT	POWR	0.	9.	21.	8.	7.	2.	19.	0.	39.	COAL	39.	10	0.19	0.17	0.61
12	IGGTST	INT-GAS-GT	HEAT	0.	28.	61.	24.	19.	6.	0.	-40.	61.	COAL	21.	10	0.31	0.32	0.39
13	GTSOAR	GT-HRSG-10	POWR	0.	10.	23.	10.	7.	2.	16.	0.	39.	RESIDUAL	39.	10	0.21	0.17	0.62
13	GTSOAR	GT-HRSG-10	HEAT	0.	23.	53.	24.	15.	4.	0.	-27.	53.	RESIDUAL	26.	10	0.31	0.29	0.45
14	GTAC08	GT-HRSG-08	POWR	0.	11.	25.	12.	7.	2.	14.	0.	38.	RESIDUAL	38.	10	0.22	0.17	0.63
14	GTAC08	GT-HRSG-08	HEAT	0.	21.	47.	24.	13.	4.	0.	-19.	47.	RESIDUAL	28.	10	0.31	0.27	0.51
15	GTAC12	GT-HRSG-12	POWR	0.	11.	22.	10.	7.	2.	16.	0.	38.	RESIDUAL	38.	10	0.23	0.17	0.63
15	GTAC12	GT-HRSG-12	HEAT	0.	26.	51.	24.	15.	5.	0.	-28.	51.	RESIDUAL	23.	10	0.34	0.31	0.47
16	GTAC16	GT-HRSG-16	POWR	0.	11.	20.	9.	7.	2.	17.	0.	38.	RESIDUAL	38.	10	0.23	0.17	0.63
16	GTAC16	GT-HRSG-16	HEAT	0.	29.	53.	24.	17.	5.	0.	-33.	53.	RESIDUAL	20.	10	0.35	0.32	0.45
17	GTWC16	GT-HRSG-16	POWR	0.	10.	21.	8.	7.	2.	18.	0.	39.	RESIDUAL	39.	10	0.20	0.17	0.61
17	GTWC16	GT-HRSG-16	HEAT	0.	27.	60.	24.	19.	5.	0.	-38.	60.	RESIDUAL	22.	10	0.31	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20111 MW 1.94 PROCESS MILLIONS BTU/HR 24.0 PROCESS TEMP(F) 250. PRODUCT MEAT-PACKING HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.276

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 10.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	10.	16.	5.	7.	2.	23.	0.	39.	RESIDUAL	39.	10	0.20	0.17	0.61
18 CC1626 GTST-16/26 HEAT	0.	50.	84.	24.	34.	10.	0.	-84.	84.	RESIDUAL	-1.	10	0.37	0.40	0.29
19 CC1622 GTST-16/22 POWR	0.	10.	17.	5.	7.	2.	22.	0.	39.	RESIDUAL	39.	10	0.21	0.17	0.62
19 CC1622 GTST-16/22 HEAT	0.	47.	76.	24.	30.	9.	0.	-74.	76.	RESIDUAL	2.	10	0.38	0.40	0.31
20 CC1222 GTST-12/22 POWR	0.	10.	17.	5.	7.	2.	22.	0.	39.	RESIDUAL	39.	10	0.21	0.17	0.62
20 CC1222 GTST-12/22 HEAT	0.	47.	76.	24.	30.	9.	0.	-74.	76.	RESIDUAL	2.	10	0.38	0.40	0.32
21 CC0822 GTST-08/22 POWR	0.	11.	17.	6.	7.	2.	21.	0.	38.	RESIDUAL	38.	10	0.22	0.17	0.63
21 CC0822 GTST-08/22 HEAT	0.	41.	64.	24.	25.	7.	0.	-56.	64.	RESIDUAL	8.	10	0.39	0.38	0.37
22 STIG15 STIG-15-16 POWR	0.	4.	17.	0.	7.	2.	28.	0.	45.	RESIDUAL	45.	10	0.07	0.15	0.53
22 STIG15 STIG-15-16 HEAT	0.	380.	1846.	24.	703.	206.	0.	-2177.	1846.	RESIDUAL	-331.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	5.	18.	2.	7.	2.	25.	0.	44.	RESIDUAL	44.	10	0.10	0.15	0.55
23 STIG10 STIG-10-16 HEAT	0.	50.	181.	24.	65.	19.	0.	-183.	181.	RESIDUAL	-1.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	6.	20.	4.	7.	2.	23.	0.	43.	RESIDUAL	43.	10	0.12	0.15	0.56
24 STIG1S STIG-1S-16 HEAT	0.	34.	114.	24.	38.	11.	0.	-99.	114.	RESIDUAL	15.	10	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	10.	18.	6.	7.	2.	21.	0.	39.	RESIDUAL	39.	10	0.20	0.17	0.61
25 DEADV3 DIESEL-ADV HEAT	0.	40.	72.	24.	27.	8.	0.	-63.	72.	RESIDUAL	9.	0	0.36	0.37	0.33
26 DEADV2 DIESEL-ADV POWR	0.	10.	18.	6.	7.	2.	21.	0.	39.	RESIDUAL	39.	11	0.20	0.17	0.61
26 DEADV2 DIESEL-ADV HEAT	0.	40.	72.	24.	27.	8.	0.	-63.	72.	RESIDUAL	9.	1	0.36	0.37	0.33
27 DEADV1 DIESEL-ADV POWR	0.	12.	18.	7.	7.	2.	20.	0.	37.	RESIDUAL	37.	11	0.24	0.18	0.64
27 DEADV1 DIESEL-ADV HEAT	0.	37.	58.	24.	21.	6.	0.	-46.	58.	RESIDUAL	11.	1	0.39	0.37	0.41
28 DEHTPM ADV-DIESEL POWR	0.	12.	18.	8.	7.	2.	19.	0.	37.	RESIDUAL	37.	10	0.24	0.18	0.65
28 DEHTPM ADV-DIESEL HEAT	0.	36.	55.	24.	20.	6.	0.	-42.	55.	RESIDUAL	13.	0	0.40	0.37	0.44
29 DESOA3 DIESEL-SOA POWR	0.	9.	18.	6.	7.	2.	21.	0.	40.	DISTILLA	40.	0	0.19	0.17	0.50
29 DESOA3 DIESEL-SOA HEAT	0.	38.	76.	24.	27.	8.	0.	-65.	76.	DISTILLA	11.	0	0.33	0.36	0.32
29 DESOA3 DIESEL-SOA POWR	0.	9.	18.	6.	7.	2.	21.	0.	40.	RESIDUAL	40.	0	0.19	0.17	0.60
29 DESOA3 DIESEL-SOA HEAT	0.	38.	76.	24.	27.	8.	0.	-65.	76.	RESIDUAL	11.	0	0.33	0.36	0.32

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20111 MW 1.94 PROCESS MILLIONS BTU/HR 24.0 PROCESS TEMP(F) 250. PRODUCT MEAT-PACKING HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.276

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 10.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	9.	18.	6.	7.	2.	21.	0.	40.	DISTILLA	40.	1	0.19	0.17	0.60
30 DESOA2 DIESEL-SOA HEAT	0.	38.	76.	24.	27.	8.	0.	-65.	76.	DISTILLA	11.	1	0.33	0.36	0.32
30 DESOA2 DIESEL-SOA POWR	0.	9.	18.	6.	7.	2.	21.	0.	40.	RESIDUAL	40.	1	0.19	0.17	0.60
30 DESOA2 DIESEL-SOA HEAT	0.	38.	76.	24.	27.	8.	0.	-65.	76.	RESIDUAL	11.	1	0.33	0.36	0.32
31 DESOA1 DIESEL-SOA POWR	0.	12.	18.	8.	7.	2.	19.	0.	37.	DISTILLA	37.	1	0.24	0.18	0.64
31 DESOA1 DIESEL-SOA HEAT	0.	35.	57.	24.	20.	6.	0.	-43.	57.	DISTILLA	13.	1	0.39	0.36	0.42
31 DESOA1 DIESEL-SOA POWR	0.	12.	18.	8.	7.	2.	19.	0.	37.	RESIDUAL	37.	1	0.24	0.18	0.64
31 DESOA1 DIESEL-SOA HEAT	0.	35.	57.	24.	20.	6.	0.	-43.	57.	RESIDUAL	13.	1	0.39	0.36	0.42
32 GTSOAD GT-HRSG-10 POWR	0.	11.	23.	11.	7.	2.	16.	0.	39.	DISTILLA	38.	10	0.22	0.17	0.63
32 GTSOAD GT-HRSG-10 HEAT	0.	24.	50.	24.	15.	4.	0.	-25.	50.	DISTILLA	25.	10	0.32	0.29	0.48
33 GTRA08 GT-85RE-08 POWR	0.	10.	19.	7.	7.	2.	20.	0.	39.	DISTILLA	39.	10	0.21	0.17	0.62
33 GTRA08 GT-85RE-08 HEAT	0.	36.	64.	24.	23.	7.	0.	-50.	64.	DISTILLA	13.	10	0.36	0.36	0.38
34 GTRA12 GT-85RE-12 POWR	0.	10.	18.	7.	7.	2.	20.	0.	38.	DISTILLA	38.	10	0.21	0.17	0.62
34 GTRA12 GT-85RE-12 HEAT	0.	36.	63.	24.	23.	7.	0.	-50.	63.	DISTILLA	13.	10	0.36	0.36	0.38
35 GTRA16 GT-85RE-16 POWR	0.	10.	19.	7.	7.	2.	19.	0.	38.	DISTILLA	38.	10	0.21	0.17	0.62
35 GTRA16 GT-85RE-16 HEAT	0.	34.	61.	24.	21.	6.	0.	-46.	61.	DISTILLA	15.	10	0.36	0.35	0.39
36 GTR208 GT-60RE-08 POWR	0.	10.	21.	9.	7.	2.	18.	0.	38.	DISTILLA	38.	10	0.21	0.17	0.62
36 GTR208 GT-60RE-08 HEAT	0.	28.	56.	24.	18.	5.	0.	-35.	56.	DISTILLA	21.	10	0.34	0.32	0.43
37 GTR212 GT-60RE-12 POWR	0.	10.	20.	8.	7.	2.	19.	0.	39.	DISTILLA	39.	10	0.21	0.17	0.62
37 GTR212 GT-60RE-12 HEAT	0.	30.	58.	24.	19.	6.	0.	-40.	58.	DISTILLA	19.	10	0.34	0.33	0.41
38 GTR216 GT-60RE-16 POWR	0.	11.	20.	8.	7.	2.	19.	0.	38.	DISTILLA	38.	10	0.22	0.17	0.63
38 GTR216 GT-60RE-16 HEAT	0.	31.	58.	24.	20.	6.	0.	-41.	58.	DISTILLA	18.	10	0.35	0.34	0.41
39 GTRW08 GT-85RE-08 POWR	0.	9.	19.	6.	7.	2.	21.	0.	40.	DISTILLA	40.	10	0.18	0.16	0.60
39 GTRW08 GT-85RE-08 HEAT	0.	36.	78.	24.	27.	8.	0.	-65.	78.	DISTILLA	13.	10	0.31	0.35	0.31
40 GTRW12 GT-85RE-12 POWR	0.	9.	18.	6.	7.	2.	22.	0.	40.	DISTILLA	40.	10	0.19	0.17	0.60
40 GTRW12 GT-85RE-12 HEAT	0.	39.	78.	24.	28.	8.	0.	-68.	78.	DISTILLA	10.	10	0.33	0.36	0.31

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20111 MW 1.94 PROCESS MILLIONS BTU/HR 24.0 PROCESS TEMP(F) 250. PRODUCT MEAT-PACKING HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.276

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 10.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	9.	19.	6.	7.	2.	21.	0.	40.	DISTILLA	40.	10	0.19	0.17	0.60
41 GTRW16 GT-85RE-16 HEAT	0.	37.	74.	24.	27.	8.	0.	-62.	74.	DISTILLA	12.	10	0.33	0.36	0.32
42 GTR308 GT-60RE-08 POWR	0.	8.	21.	8.	7.	2.	19.	0.	41.	DISTILLA	41.	10	0.17	0.16	0.59
42 GTR308 GT-60RE-08 HEAT	0.	26.	66.	24.	21.	6.	0.	-44.	66.	DISTILLA	23.	10	0.28	0.31	0.36
43 GTR312 GT-60RE-12 POWR	0.	9.	19.	7.	7.	2.	20.	0.	40.	DISTILLA	40.	10	0.19	0.17	0.60
43 GTR312 GT-60RE-12 HEAT	0.	33.	69.	24.	24.	7.	0.	-53.	69.	DISTILLA	16.	10	0.32	0.34	0.35
44 GTR316 GT-60RE-16 POWR	0.	9.	20.	7.	7.	2.	20.	0.	40.	DISTILLA	40.	10	0.19	0.17	0.60
44 GTR316 GT-60RE-16 HEAT	0.	32.	69.	24.	23.	7.	0.	-52.	69.	DISTILLA	17.	10	0.32	0.34	0.35
45 FCPADS FUEL-CL-PH POWR	0.	9.	17.	5.	7.	2.	22.	0.	40.	DISTILLA	40.	0	0.19	0.17	0.61
45 FCPADS FUEL-CL-PH HEAT	0.	43.	81.	24.	31.	9.	0.	-76.	81.	DISTILLA	5.	0	0.35	0.38	0.29
46 FCMCDS FUEL-CL-MO POWR	0.	9.	16.	4.	7.	2.	24.	0.	40.	DISTILLA	40.	10	0.18	0.17	0.60
46 FCMCDS FUEL-CL-MO HEAT	0.	58.	103.	24.	42.	12.	0.	-112.	103.	DISTILLA	-9.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20261 MW 1.31 PROCESS MILLIONS BTU/HR 11.0 PROCESS TEMP(F) 250. PRODUCT FLUID-MILK HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.406

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 6.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	13.	14.	13.	RESIDUAL	27.	0	0.	0.17	0.41
1 STM141 STM-TURB-1 POWR	0.	4.	23.	15.	4.	1.	-5.	0.	23.	RESIDUAL	23.	10	0.15	0.20	0.46
1 STM141 STM-TURB-1 HEAT	0.	6.	17.	11.	3.	1.	0.	4.	17.	RESIDUAL	20.	10	0.24	0.16	0.54
1 STM141 STM-TURB-1 POWR	0.	4.	23.	15.	4.	1.	-5.	0.	23.	COAL-FGD	23.	10	0.15	0.20	0.48
1 STM141 STM-TURB-1 HEAT	0.	6.	17.	11.	3.	1.	0.	4.	17.	COAL-FGD	20.	10	0.24	0.16	0.54
1 STM141 STM-TURB-1 POWR	0.	4.	23.	15.	4.	1.	-5.	0.	23.	COAL-AFB	23.	10	0.15	0.20	0.48
1 STM141 STM-TURB-1 HEAT	0.	6.	17.	11.	3.	1.	0.	4.	17.	COAL-AFB	20.	10	0.24	0.16	0.54
2 STM088 STM-TURB-8 POWR	0.	-1.	27.	19.	4.	1.	-9.	0.	27.	RESIDUAL	27.	10	-0.02	0.16	0.40
2 STM088 STM-TURB-8 HEAT	0.	5.	16.	11.	3.	1.	0.	6.	16.	RESIDUAL	22.	10	0.19	0.12	0.50
2 STM088 STM-TURB-8 POWR	0.	-1.	27.	19.	4.	1.	-9.	0.	27.	COAL-FGD	27.	10	-0.02	0.16	0.40
2 STM088 STM-TURB-8 HEAT	0.	5.	16.	11.	3.	1.	0.	6.	16.	COAL-FGD	22.	10	0.19	0.12	0.50
2 STM088 STM-TURB-8 POWR	0.	-1.	27.	19.	4.	1.	-9.	0.	27.	COAL-AFB	27.	10	-0.02	0.16	0.40
2 STM088 STM-TURB-8 HEAT	0.	5.	16.	11.	3.	1.	0.	6.	16.	COAL-AFB	22.	10	0.19	0.12	0.50
3 PFBSTM PFB-STMTB- POWR	0.	9.	17.	10.	4.	1.	1.	0.	18.	COAL-PFB	18.	10	0.32	0.24	0.60
3 PFBSTM PFB-STMTB- HEAT	0.	9.	19.	11.	5.	1.	0.	-1.	19.	COAL-PFB	18.	10	0.33	0.26	0.59
4 TISTMT TI-STMTB-1 POWR	0.	9.	15.	8.	4.	1.	4.	0.	18.	RESIDUAL	18.	10	0.32	0.24	0.60
4 TISTMT TI-STMTB-1 HEAT	0.	12.	20.	11.	6.	2.	0.	-5.	20.	RESIDUAL	15.	10	0.37	0.30	0.54
4 TISTMT TI-STMTB-1 POWR	0.	9.	15.	8.	4.	1.	4.	0.	18.	COAL	18.	10	0.32	0.24	0.60
4 TISTMT TI-STMTB-1 HEAT	0.	12.	20.	11.	6.	2.	0.	-5.	20.	COAL	15.	10	0.37	0.30	0.54
5 TIHRSG THERMIONIC POWR	0.	-5.	32.	22.	4.	1.	-12.	0.	32.	RESIDUAL	32.	10	-0.18	0.14	0.35
5 TIHRSG THERMIONIC HEAT	0.	4.	16.	11.	2.	1.	0.	7.	16.	RESIDUAL	23.	10	0.14	0.10	0.48
5 TIHRSG THERMIONIC POWR	0.	-5.	32.	22.	4.	1.	-12.	0.	32.	COAL	32.	10	-0.18	0.14	0.35
5 TIHRSG THERMIONIC HEAT	0.	4.	16.	11.	2.	1.	0.	7.	16.	COAL	23.	10	0.14	0.10	0.48
6 STIRL STIRLING-1 POWR	0.	7.	14.	7.	4.	1.	5.	0.	20.	DISTILLA	20.	0	0.27	0.23	0.56
6 STIRL STIRLING-1 HEAT	0.	12.	24.	11.	7.	2.	0.	-9.	24.	DISTILLA	15.	0	0.33	0.31	0.45

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20261 MW 1.31 PROCESS MILLIONS BTU/HR 11.0 PROCESS TEMP(F) 250. PRODUCT FLUID-MILK HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.406

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 6.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	7.	14.	7.	4.	1.	5.	0.	20.	RESIDUAL	20.	0	0.27	0.23	0.56
6 STIRL	STIRLING-1	HEAT	0.	12.	24.	11.	7.	2.	0.	-9.	24.	RESIDUAL	15.	0	0.33	0.31	0.45
6 STIRL	STIRLING-1	POWR	0.	7.	14.	7.	4.	1.	5.	0.	20.	COAL	20.	0	0.27	0.23	0.56
6 STIRL	STIRLING-1	HEAT	0.	12.	24.	11.	7.	2.	0.	-9.	24.	COAL	15.	0	0.33	0.31	0.45
7 HEGT85	HELIUM-GT-	POWR	0.	7.	14.	6.	4.	1.	6.	0.	20.	COAL-AFB	20.	10	0.25	0.22	0.54
7 HEGT85	HELIUM-GT-	HEAT	0.	13.	27.	11.	9.	3.	0.	-13.	27.	COAL-AFB	14.	10	0.32	0.32	0.40
8 HEGT60	HELIUM-GT-	POWR	0.	4.	17.	7.	4.	1.	5.	0.	22.	COAL-AFB	22.	10	0.16	0.20	0.49
8 HEGT60	HELIUM-GT-	HEAT	0.	7.	29.	11.	7.	2.	0.	-9.	29.	COAL-AFB	19.	10	0.20	0.26	0.38
9 HEGT00	HELIUM-GT-	POWR	0.	2.	25.	13.	4.	1.	-3.	0.	25.	COAL-AFB	25.	10	0.06	0.18	0.43
9 HEGT00	HELIUM-GT-	HEAT	0.	3.	21.	11.	4.	1.	0.	2.	21.	COAL-AFB	24.	10	0.13	0.16	0.47
10 FCMCCL	FUEL-CL-MO	POWR	0.	7.	15.	7.	4.	1.	5.	0.	19.	COAL	19.	10	0.28	0.23	0.57
10 FCMCCL	FUEL-CL-MO	HEAT	0.	12.	23.	11.	7.	2.	0.	-8.	23.	COAL	15.	10	0.34	0.30	0.48
11 FCSTCL	FUEL-CL-ST	POWR	0.	8.	11.	4.	4.	1.	8.	0.	19.	COAL	19.	10	0.29	0.23	0.58
11 FCSTCL	FUEL-CL-ST	HEAT	0.	22.	30.	11.	12.	4.	0.	-25.	30.	COAL	5.	10	0.42	0.41	0.37
12 IGGTST	INT-GAS-GT	POWR	0.	6.	14.	6.	4.	1.	6.	0.	21.	COAL	21.	10	0.24	0.22	0.54
12 IGGTST	INT-GAS-GT	HEAT	0.	13.	28.	11.	9.	3.	0.	-14.	28.	COAL	14.	10	0.31	0.32	0.39
13 GTSOAR	GT-HRSG-10	POWR	0.	7.	15.	7.	4.	1.	5.	0.	20.	RESIDUAL	20.	10	0.25	0.22	0.55
13 GTSOAR	GT-HRSG-10	HEAT	0.	11.	24.	11.	7.	2.	0.	-8.	24.	RESIDUAL	16.	10	0.31	0.29	0.45
14 GTAC08	GT-HRSG-08	POWR	0.	7.	17.	8.	4.	1.	3.	0.	20.	RESIDUAL	20.	10	0.27	0.23	0.56
14 GTAC08	GT-HRSG-08	HEAT	0.	10.	22.	11.	6.	2.	0.	-4.	22.	RESIDUAL	17.	10	0.31	0.27	0.51
15 GTAC12	GT-HRSG-12	POWR	0.	7.	15.	7.	4.	1.	5.	0.	19.	RESIDUAL	19.	10	0.28	0.23	0.57
15 GTAC12	GT-HRSG-12	HEAT	0.	12.	23.	11.	7.	2.	0.	-8.	23.	RESIDUAL	15.	10	0.34	0.31	0.47
16 GTAC16	GT-HRSG-16	POWR	0.	7.	14.	6.	4.	1.	6.	0.	19.	RESIDUAL	19.	10	0.28	0.23	0.56
16 GTAC16	GT-HRSG-16	HEAT	0.	13.	25.	11.	8.	2.	0.	-11.	25.	RESIDUAL	14.	10	0.35	0.32	0.45
17 GTWC16	GT-HRSG-16	POWR	0.	7.	14.	6.	4.	1.	6.	0.	20.	RESIDUAL	20.	10	0.24	0.22	0.54
17 GTWC16	GT-HRSG-16	HEAT	0.	13.	27.	11.	9.	3.	0.	-13.	27.	RESIDUAL	14.	10	0.31	0.32	0.40

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I&SE PEO ADV DESIGN ENGR

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20261 MW 1.31 PROCESS MILLIONS BTU/HR 11.0 PROCESS TEMP(F) 250. PRODUCT FLUID-MILK HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.406

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 6.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT. 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	7.	11.	3.	4.	1.	9.	0.	20.	RESIDUAL	20.	10	0.24	0.22	0.54
18 CC1626 GTST-16/26 HEAT	0.	23.	38.	11.	15.	5.	0.	-34.	38.	RESIDUAL	4.	10	0.37	0.40	0.29
19 CC1622 GTST-16/22 POWR	0.	7.	11.	4.	4.	1.	9.	0.	20.	RESIDUAL	20.	10	0.26	0.22	0.55
19 CC1622 GTST-16/22 HEAT	0.	21.	35.	11.	14.	4.	0.	-30.	35.	RESIDUAL	5.	10	0.38	0.40	0.31
20 CC1222 GTST-12/22 POWR	0.	7.	11.	4.	4.	1.	9.	0.	20.	RESIDUAL	20.	10	0.26	0.22	0.55
20 CC1222 GTST-12/22 HEAT	0.	22.	35.	11.	14.	4.	0.	-29.	35.	RESIDUAL	5.	10	0.38	0.40	0.32
21 CC0822 GTST-08/22 POWR	0.	7.	12.	4.	4.	1.	8.	0.	19.	RESIDUAL	19.	10	0.28	0.23	0.56
21 CC0822 GTST-08/22 HEAT	0.	19.	29.	11.	11.	3.	0.	-21.	29.	RESIDUAL	8.	10	0.39	0.38	0.37
22 STIG15 STIG-15-16 POWR	0.	2.	12.	0.	4.	1.	13.	0.	24.	RESIDUAL	24.	10	0.09	0.18	0.45
22 STIG15 STIG-15-16 HEAT	0.	174.	846.	11.	322.	94.	0.	-993.	846.	RESIDUAL	-147.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	3.	12.	2.	4.	1.	11.	0.	23.	RESIDUAL	23.	10	0.13	0.19	0.47
23 STIG10 STIG-10-16 HEAT	0.	23.	83.	11.	30.	9.	0.	-79.	83.	RESIDUAL	4.	10	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	4.	13.	3.	4.	1.	10.	0.	23.	RESIDUAL	23.	10	0.15	0.19	0.48
24 STIG1S STIG-1S-16 HEAT	0.	15.	52.	11.	17.	5.	0.	-41.	52.	RESIDUAL	11.	10	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	7.	12.	4.	4.	1.	8.	0.	20.	RESIDUAL	20.	10	0.26	0.22	0.55
25 DEADV3 DIESEL-ADV HEAT	0.	18.	31.	11.	12.	3.	0.	-22.	31.	RESIDUAL	9.	0	0.37	0.37	0.35
26 DEADV2 DIESEL-ADV POWR	0.	7.	12.	4.	4.	1.	8.	0.	20.	RESIDUAL	20.	11	0.26	0.22	0.55
26 DEADV2 DIESEL-ADV HEAT	0.	18.	31.	11.	12.	3.	0.	-22.	31.	RESIDUAL	9.	1	0.37	0.37	0.35
27 DEADV1 DIESEL-ADV POWR	0.	8.	12.	5.	4.	1.	7.	0.	19.	RESIDUAL	19.	11	0.29	0.23	0.58
27 DEADV1 DIESEL-ADV HEAT	0.	17.	26.	11.	10.	3.	0.	-16.	26.	RESIDUAL	10.	1	0.40	0.37	0.42
28 DEHTPM ADV-DIESEL POWR	0.	8.	12.	5.	4.	1.	7.	0.	19.	RESIDUAL	19.	10	0.30	0.24	0.58
28 DEHTPM ADV-DIESEL HEAT	0.	16.	25.	11.	9.	3.	0.	-15.	25.	RESIDUAL	10.	0	0.40	0.37	0.44
29 DESOA3 DIESEL-SOA POWR	0.	7.	12.	4.	4.	1.	8.	0.	20.	DISTILLA	20.	0	0.24	0.22	0.54
29 DESOA3 DIESEL-SOA HEAT	0.	17.	32.	11.	12.	3.	0.	-22.	32.	DISTILLA	10.	0	0.35	0.36	0.34
29 DESOA3 DIESEL-SOA POWR	0.	7.	12.	4.	4.	1.	8.	0.	20.	RESIDUAL	20.	0	0.24	0.22	0.54
29 DESOA3 DIESEL-SOA HEAT	0.	17.	32.	11.	12.	3.	0.	-22.	32.	RESIDUAL	10.	0	0.35	0.36	0.34

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20261 MW 1.31 PROCESS MILLIONS BTU/HR 11.0 PROCESS TEMP(F) 250. PRODUCT FLUID-MILK HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.406

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 6.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	7.	12.	4.	4.	1.	8.	0.	20.	DISTILLA	20.	1	0.24	0.22	0.54
30	DESOA2	DIESEL-SOA	HEAT	0.	17.	32.	11.	12.	3.	0.	-22.	32.	DISTILLA	10.	1	0.35	0.36	0.34
30	DESOA2	DIESEL-SOA	POWR	0.	7.	12.	4.	4.	1.	8.	0.	20.	RESIDUAL	20.	1	0.24	0.22	0.54
30	DESOA2	DIESEL-SOA	HEAT	0.	17.	32.	11.	12.	3.	0.	-22.	32.	RESIDUAL	10.	1	0.35	0.36	0.34
31	DESOA1	DIESEL-SOA	POWR	0.	8.	12.	5.	4.	1.	7.	0.	19.	DISTILLA	19.	1	0.29	0.23	0.58
31	DESOA1	DIESEL-SOA	HEAT	0.	16.	26.	11.	9.	3.	0.	-15.	26.	DISTILLA	11.	1	0.39	0.36	0.43
31	DESOA1	DIESEL-SOA	POWR	0.	8.	12.	5.	4.	1.	7.	0.	19.	RESIDUAL	19	1	0.29	0.23	0.58
31	DESOA1	DIESEL-SOA	HEAT	0.	16.	26.	11.	9.	3.	0.	-15.	26.	RESIDUAL	[illegible]	1	0.39	0.36	0.43
32	GTSOAD	GT-HRSG-10	POWR	0.	7.	15.	7.	4.	1.	4.	0.	20.	DISTILLA	20.	10	0.27	0.23	0.56
32	GTSOAD	GT-HRSG-10	HEAT	0.	11.	23.	11.	7.	2.	0.	-7.	23.	DISTILLA	16.	10	0.32	0.29	0.48
33	GTRA08	GT-85RE-08	POWR	0.	7.	13.	5.	4.	1.	7.	0.	20.	DISTILLA	20.	10	0.26	0.22	0.55
33	GTRA08	GT-85RE-08	HEAT	0.	16.	29.	11.	10.	3.	0.	-19.	29.	DISTILLA	11.	10	0.36	0.36	0.38
34	GTRA12	GT-85RE-12	POWR	0.	7.	12.	5.	4.	1.	7.	0.	20.	DISTILLA	20.	10	0.26	0.23	0.55
34	GTRA12	GT-85RE-12	HEAT	0.	16.	29.	11.	10.	3.	0.	-18.	29.	DISTILLA	11.	10	0.36	0.36	0.38
35	GTRA16	GT-85RE-16	POWR	0.	7.	13.	5.	4.	1.	7.	0.	20.	DISTILLA	20.	10	0.26	0.23	0.55
35	GTRA16	GT-85RE-16	HEAT	0.	15.	28.	11.	10.	3.	0.	-17.	26.	DISTILLA	[illegible]	10	0.36	0.35	0.39
36	GTR208	GT-60RE-08	POWR	0.	7.	14.	6.	4.	1.	6.	0.	20.	DISTILLA	20.	10	0.26	0.22	0.55
36	GTR208	GT-60RE-08	HEAT	0.	13.	26.	11.	8.	2.	0.	-12.	26.	DISTILLA	14.	10	0.34	0.32	0.43
37	GTR212	GT-60RE-12	POWR	0.	7.	14.	6.	4.	1.	6.	0.	20.	DISTILLA	20.	10	0.26	0.22	0.55
37	GTR212	GT-60RE-12	HEAT	0.	14.	27.	11.	9.	3.	0.	-14.	27.	DISTILLA	13.	10	0.34	0.33	0.41
38	GTR216	GT-60RE-16	POWR	0.	7.	13.	5.	4.	1.	7.	0.	20.	DISTILLA	20.	10	0.26	0.23	0.56
38	GTR216	GT-60RE-16	HEAT	0.	[illegible]	27.	11.	9.	3.	0.	-14.	27.	DISTILLA	13.	10	0.35	0.34	0.41
39	GTRW08	GT-85RE-08	POWR	0.	6.	13.	4.	4.	1.	8.	0.	21.	DISTILLA	21.	10	0.22	0.21	0.52
39	GTRW08	GT-85RE-08	HEAT	0.	16.	36.	11.	13.	4.	0.	-25.	36.	DISTILLA	11.	10	0.31	0.35	0.31
40	GTRW12	GT-85RE-12	POWR	0.	6.	12.	4.	4.	1.	8.	0.	21.	DISTILLA	21.	10	0.23	0.22	0.53
40	GTRW12	GT-85RE-12	HEAT	0.	18.	36.	11.	13.	4.	0.	-27.	36.	DISTILLA	9.	10	0.33	0.36	0.31

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20261 MW 1.31 PROCESS MILLIONS BTU/HR 11.0 PROCESS TEMP(F) 250. PRODUCT FLUID-MILK HOURS PER YEAR 2100.

POWER TO HEAT RATIO 0.406

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 6.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	GTRW16	GT-85RE-16	POWR	0.	6.	13.	4.	4.	1.	8.	0.	21.	DISTILLA	21.	10	0.23	0.22	0.53
41	GTRW16	GT-85RE-16	HEAT	0.	17.	34.	11.	12.	4.	0.	-24.	34.	DISTILLA	10.	10	0.33	0.36	0.32
42	GTR308	GT-60RE-08	POWR	0.	6.	14.	5.	4.	1.	7.	0.	21.	DISTILLA	21.	10	0.21	0.21	0.52
42	GTR308	GT-60RE-08	HEAT	0.	12.	30.	11.	9.	3.	0.	-16.	30.	DISTILLA	15.	10	0.28	0.31	0.36
43	GTR312	GT-60RE-12	POWR	0.	6.	13.	5.	4.	1.	8.	0.	21.	DISTILLA	21.	10	0.23	0.22	0.53
43	GTR312	GT-60RE-12	HEAT	0.	15.	32.	11.	11.	3.	0.	-20.	32.	DISTILLA	12.	10	0.32	0.34	0.35
44	GTR316	GT-60RE-16	POWR	0.	6.	13.	5.	4.	1.	8.	0.	21.	DISTILLA	21.	10	0.23	0.22	0.53
44	GTR316	GT-60RE-16	HEAT	0.	15.	32.	11.	11.	3.	0.	-19.	32.	DISTILLA	12.	10	0.32	0.34	0.35
45	FCPADS	FUEL-CL-PH	POWR	0.	7.	12.	4.	4.	1.	8.	0.	20.	DISTILLA	20.	0	0.25	0.22	0.55
45	FCPADS	FUEL-CL-PH	HEAT	0.	19.	34.	11.	13.	4.	0.	-2[illegible].	34.	DISTILLA	8.	0	0.36	0.38	0.33
46	FCMCDS	FUEL-CL-MO	POWR	0.	6.	11.	3.	4.	1.	10.	0.	21.	DISTILLA	21.	10	0.23	0.21	0.53
46	FCMCDS	FUEL-CL-MO	HEAT	0.	27.	47.	11.	19.	6.	0.	-47.	47.	DISTILLA	0.	0	0.36	0.41	0.23

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20461 MW 28.50 PROCESS MILLIONS BTU/HR 659.0 PROCESS TEMP(F) 250. PRODUCT WET-CORN-MIL HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	775.	304.	775.	COAL-FGD	1079.	0	0.	0.09	0.61
1 STM141	STM-TURB-1	POWR	0.	189.	495.	323.	97.	29.	395.	0.	890.	RESIDUAL	890.	0	0.18	0.11	0.74
1 STM141	STM-TURB-1	HEAT	0.	386.	1008.	659.	198.	58.	0.	-315.	1008.	RESIDUAL	693.	0	0.28	0.20	0.65
1 STM141	STM-TURB-1	POWR	0.	189.	495.	323.	97.	29.	395.	0.	890.	COAL-FGD	890.	0	0.18	0.11	0.74
1 STM141	STM-TURB-1	HEAT	0.	386.	1008.	659.	198.	58.	0.	-315.	1008.	COAL-FGD	693.	0	0.28	0.20	0.65
1 STM141	STM-TURB-1	POWR	0.	189.	495.	323.	97.	29.	395.	0.	890.	COAL-AFB	890.	0	0.18	0.11	0.74
1 STM141	STM-TURB-1	HEAT	0.	386.	1008.	659.	198.	58.	0.	-315.	1008.	COAL-AFB	693.	0	0.28	0.20	0.65
2 STMO88	STM-TURB-8	POWR	0.	189.	596.	410.	97.	29.	293.	0.	890.	RESIDUAL	890.	0	0.18	0.11	0.74
2 STMO88	STM-TURB-8	HEAT	0.	305.	959.	659.	156.	46.	0.	-185.	959.	RESIDUAL	774.	0	0.24	0.16	0.69
2 STMO88	STM-TURB-8	POWR	0.	189.	596.	410.	97.	29.	293.	0.	890.	COAL-FGD	890.	0	0.18	0.11	0.74
2 STMO88	STM-TURB-8	HEAT	0.	305.	959.	659.	156.	46.	0.	-185.	959.	COAL-FGD	774.	0	0.24	0.16	0.69
2 STMO88	STM-TURB-8	POWR	0.	189.	596.	410.	97.	29.	293.	0.	890.	COAL-AFB	890.	0	0.18	0.11	0.74
2 STMO88	STM-TURB-8	HEAT	0.	305.	959.	659.	156.	46.	0.	-185.	959.	COAL-[illegible]	774.	0	0.24	0.16	0.69
3 PFBSTM	PFB-STMTB-	POWR	0.	188.	378.	2[illegible]3.	97.	29.	513.	0.	891.	COAL-PFB	891.	0	0.17	0.11	0.74
3 PFBSTM	PFB-STMTB-	HEAT	0.	555.	1118.	659.	287.	84.	0.	-594.	1118.	COAL-PFB	524.	0	0.33	0.26	0.59
4 TISTMT	T[illegible]B-1	POWR	0.	187.	321.	173.	97.	29.	571.	0.	892.	RESIDUAL	892.	0	0.17	0.11	0.74
4 TISTMT	TI-STMTB-1	HEAT	0.	710.	1220.	659.	370.	108.	0.	-852.	1220.	RESIDUAL	369.	0	0.37	0.30	0.54
4 TISTMT	TI-STMTB-1	POWR	0.	187.	321.	173.	97.	29.	571.	0.	892.	COAL	892.	0	0.17	0.11	0.74
4 TISTMT	TI-STMTB-1	HEAT	0.	710.	1220.	659.	370.	108.	0.	-852.	1220.	COAL	369.	0	0.37	0.30	0.54
5 TIHRSG	THERMIONIC	POWR	0.	164.	691.	469.	97.	29.	224.	0.	915.	RESIDUAL	915.	0	0.15	0.11	0.72
5 TIHRSG	THERMIONIC	HEAT	0.	231.	971.	659.	137.	40.	0.	-123.	971.	RESIDUAL	848.	0	0.19	0.14	0.68
5 TIHRSG	THERMIONIC	POWR	0.	164.	691.	469.	97.	29.	224.	0.	915.	COAL	915.	0	0.15	0.11	0.72
5 TIHRSG	THERMIONIC	HEAT	0.	231.	971.	659.	137.	40.	0.	-123.	971.	COAL	848.	0	0.19	0.14	0.68
6 STIRL	STIRLING-1	POWR	0.	139.	352.	159.	97.	29.	588.	0.	940.	DISTILLA	940.	0	0.13	0.10	0.70
6 STIRL	STIRLING-1	HEAT	0.	577.	1457.	659.	403.	118.	0.	-955.	1457.	DISTILLA	502.	0	0.28	0.28	C.45

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20461 MW 28.50 PROCESS MILLIONS BTU/HR 659.0 PROCESS TEMP(F) 250. PRODUCT WET-CORN-MIL HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	139.	352.	159.	97.	29.	588.	0.	940.	RESIDUAL	940.	0	0.13	0.10	0.70
6 STIRL STIRLING-1 HEAT	0.	577.	1457.	659.	403.	118.	0.	-955.	1457.	RESIDUAL	502.	0	0.28	0.28	0.45
6 STIRL STIRLING-1 POWR	0.	139.	352.	159.	97.	29.	588.	0.	940.	COAL	940.	0	0.13	0.10	0.70
6 STIRL STIRLING-1 HEAT	0.	577.	1457.	659.	403.	118.	0.	-955	1457.	COAL	502.	0	0.28	0.28	0.45
7 HEGT85 HELIUM-GT- POWR	0.	98.	303.	82.	97.	29.	678.	0.	981.	COAL-AFB	981.	10	0.09	0.10	0.67
7 HEGT85 HELIUM-GT- HEAT	0.	783.	2424.	659.	778.	228.	0.	-2128.	2424.	COAL-AFB	296.	0	0.24	0.32	0.27
8 HEGT60 HELIUM-GT- POWR	0.	96.	375.	143.	97.	29.	607.	0.	983.	COAL-AFB	983.	10	0.09	0.10	0.67
8 HEGT60 HELIUM-GT- HEAT	0.	445.	1734.	659.	449.	132.	0.	-1100.	1734.	COAL-AFB	635.	0	0.20	0.26	0.38
9 HEGT00 HELIUM-GT- POWR	0.	88.	553.	287.	97.	29.	438.	0.	991.	COAL-AFB	991.	10	0.08	0.10	0.67
9 HEGT00 HELIUM-GT- HEAT	0.	203.	1271.	659.	224.	66.	0.	-395.	1271.	COAL-AFB	876.	0	0.14	0.18	0.52
10 FCMCCL FUEL-CL-MO POWR	0.	163.	320.	152.	97.	29.	596.	0.	916.	COAL	916.	10	0.15	0.11	0.72
10 FCMCCL FUEL-CL-MO HEAT	0.	706.	1386.	659.	421.	123.	0.	-1012.	1386.	COAL	373.	0	0.34	0.30	0.48
11 FCSTCL FUEL-CL-ST POWR	0.	170.	235.	86.	97.	29.	674.	0.	909.	COAL	909.	10	0.16	0.11	0.72
11 FCSTCL FUEL-CL-ST HEAT	0.	1299.	1800.	659.	744.	218.	0.	-2020.	1800.	COAL	-220.	0	0.42	0.41	0.37
12 IGGTST INT-GAS-GT POWR	0.	139.	306.	120.	97.	29.	634.	0.	940.	COAL	940.	10	0.13	0.10	0.70
12 IGGTST INT-GAS-GT HEAT	0.	762.	1679.	659.	533.	156.	0.	-1362.	1679.	COAL	317.	0	0.31	0.32	0.39
13 GTSOAR GT-HRSG-10 POWR	0.	148.	335.	153.	97.	29.	596.	0.	931.	RESIDUAL	931.	0	0.14	0.10	0.71
13 GTSOAR GT-HRSG-10 HEAT	0.	639.	1449.	659.	420.	123.	0.	-1309.	1449.	RESIDUAL	440.	0	0.31	0.29	0.45
14 GTAC08 GT-HRSG-08 POWR	0.	159.	360.	183.	97.	29.	560.	0.	920.	RESIDUAL	920.	0	0.15	0.11	0.72
14 GTAC08 GT-HRSG-08 HEAT	0.	573.	1296.	659.	350.	103.	0.	-789.	1296.	RESIDUAL	506.	0	0.31	0.27	0.51
15 GTAC12 GT-HRSG-12 POWR	0.	162.	319.	151.	97.	29.	598.	0.	917.	RESIDUAL	917.	0	0.15	0.11	0.72
15 GTAC12 GT-HRSG-12 HEAT	0.	710.	1395.	659.	425.	125.	0.	-1025.	1395.	RESIDUAL	369.	0	0.34	0.31	0.47
16 GTAC16 GT-HRSG-16 POWR	0.	162.	301.	135.	97.	29.	616.	0.	917.	RESIDUAL	917.	0	0.15	0.11	0.72
16 GTAC16 GT-HRSG-16 HEAT	0.	789.	1468.	659.	474.	139.	0.	-1178.	1468.	RESIDUAL	290.	0	0.35	0.32	0.45
17 GTWC16 GT-HRSG-16 POWR	0.	142.	309.	125.	97.	29.	629.	0.	938.	RESIDUAL	938.	0	0.13	0.10	0.70
17 GTWC16 GT-HRSG-16 HEAT	0.	750.	1634.	659.	515.	151.	0.	-1304.	1634.	RESIDUAL	329.	0	0.31	0.32	0.40

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POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	143.	242.	69.	97.	29.	694.	0.	936.	RESIDUAL	936.	0	0.13	0.10	0.70
18 CC1626 GTST-16/26 HEAT	0.	1361.	2302.	659.	924.	271.	0.	-2584.	2302.	RESIDUAL	-281.	0	0.37	0.40	0.29
19 CC1622 GTST-16/22 POWR	0.	150.	244.	77.	97.	29.	685.	0.	929.	RESIDUAL	929.	0	0.14	0.10	0.71
19 CC1622 GTST-16/22 HEAT	0.	1285.	2095.	659.	833.	244.	0.	-2301.	2095.	RESIDUAL	-205.	0	0.38	0.40	0.31
20 CC1222 GTST-12/22 POWR	0.	151.	243.	77.	97.	29.	685.	0.	928.	RESIDUAL	928.	0	0.14	0.10	0.71
20 CC1222 GTST-12/22 HEAT	0.	1295.	2082.	659.	833.	244.	0.	-2298.	2082.	RESIDUAL	-216.	0	0.38	0.40	0.32
21 CC0822 GTST-08/22 POWR	0.	162.	254.	95.	97.	29.	663.	0.	918.	RESIDUAL	918.	0	0.15	0.11	0.72
21 CC0822 GTST-08/22 HEAT	0.	1119.	1759.	659.	673.	197.	0.	-1799.	1759.	RESIDUAL	-39.	0	0.39	0.38	0.37
22 STIG15 STIG-15 16 POWR	0.	53.	255.	3.	97.	29.	771.	0.	1027.	RESIDUAL	1027.	0	0.05	0.09	0.64
22 STIG15 STIG-15-16 HEAT	0.	10439.	50692.	659.	19314.	5661.	0.	-60052.	50692.	RESIDUAL	-9359.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	75.	271.	36.	97.	29.	733.	0.	1004.	RESIDUAL	1004.	0	0.07	0.10	0.66
23 STIG10 STIG-10-16 HEAT	0.	1383.	4974.	659.	1786.	523.	0.	-5277.	4974.	RESIDUAL	-304.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	86.	290.	61.	97.	29.	703.	0.	993.	RESIDUAL	993.	0	0.08	0.10	0.66
24 STIG1S STIG-1S-16 HEAT	0.	924.	3126.	659.	1048.	307.	0.	-2971.	3126.	RESIDUAL	155.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	120.	262.	67.	97.	29.	697.	0.	959.	RESIDUAL	959.	0	0.11	0.10	0.69
25 DEADV3 DIESEL-ADV HEAT	0.	1189.	2594.	659.	962.	282.	0.	-2704.	2594.	RESIDUAL	-110.	0	0.31	0.37	0.25
26 DEADV2 DIESEL-ADV POWR	0.	120.	262.	67.	97.	29.	697.	0.	959.	RESIDUAL	959.	1	0.11	0.10	0.69
26 DEADV2 DIESEL-ADV HEAT	0.	1189.	2594.	659.	963.	282.	0.	-2704.	2594.	RESIDUAL	-110.	1	0.31	[illegible]	0.25
27 DEADV1 DIESEL-ADV POWR	0.	162.	262.	102.	97.	29.	655.	0.	917.	RESIDUAL	917.	1	0.15	[illegible]	0.72
27 DEADV1 DIESEL-ADV HEAT	0.	1044.	1685.	659.	625.	183.	0.	-1650.	1685.	RESIDUAL	35.	1	0.38	[illegible]	0.39
28 DEHTPM ADV-DIESEL POWR	0.	175.	266.	117.	97.	29.	638.	0.	904.	RESIDUAL	904.	0	0.16	0.11	0.73
28 DEHTPM ADV-DIESEL HEAT	0.	986.	1499.	659.	547.	160.	0.	-1406.	1499.	RESIDUAL	93.	0	0.40	0.37	0.44
29 DESOA3 DIESEL-SOA POWR	0.	104.	269.	59.	97.	29.	706.	0.	975.	DISTILLA	975.	0	0.10	0.10	0.68
29 DESOA3 DIESEL-SOA HEAT	0.	1159.	2995.	659.	1081.	317.	0.	-3075.	2995.	DISTILLA	-80.	0	0.28	0.36	0.22
29 DESOA3 DIESEL-SOA POWR	0.	104.	269.	59.	97.	29.	706.	0.	975.	RESIDUAL	975.	0	0.10	0.10	0.68
29 DESOA3 DIESEL-SOA HEAT	0.	1159.	2995.	659.	1081.	317.	0.	-3075.	2995.	RESIDUAL	-80.	0	0.28	0.36	0.22

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE P.O ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20461 MW 28.50 PROCESS MILLIONS BTU/HR 659.0 PROCESS TEMP(F) 250. PRODUCT WET-CORN-MIL HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	104.	269.	59.	97.	29.	706.	0.	975.	DISTILLA	975.	1	0.10	0.10	0.68
30	DESOA2	DIESEL-SOA	HEAT	0.	1159.	2995.	659.	1081.	317.	0.	-3075.	2995.	DISTILLA	-80.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	104.	269.	59.	97.	29.	706.	0.	975.	RESIDUAL	975.	1	0.10	0.10	0.68
30	DESOA2	DIESEL-SOA	HEAT	0.	1159.	2995.	659.	1081.	317.	0.	-3075.	2995.	RESIDUAL	-80.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	162.	269.	108.	97.	29.	648.	0.	918.	DISTILLA	918.	1	0.15	0.11	0.72
31	DESOA1	DIESEL-SOA	HEAT	0.	986.	1643.	659.	593.	174.	0.	-1550.	1643.	DISTILLA	93.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	162.	269.	108.	97.	29.	648.	0.	918.	RESIDUAL	918.	1	0.15	0.11	0.72
31	DESOA1	DIESEL-SOA	HEAT	0.	986.	1643.	659.	593.	174.	0.	-1550.	1643.	RESIDUAL	93.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	157.	333.	159.	97.	29.	589.	0.	922.	DISTILLA	922.	0	0.15	0.11	0.71
32	GTSOAD	GT-HRSG-10	HEAT	0.	654.	1384.	659.	404.	118.	0.	-959.	1384.	DISTILLA	425.	0	0.32	0.29	0.48
33	GTRA08	GT-85RE-08	POWR	0.	152.	272.	103.	97.	29.	655.	0.	927.	DISTILLA	927.	0	0.14	0.10	0.71
33	GTRA08	GT-85RE-08	HEAT	0.	978.	1750.	659.	625.	183.	0.	-1648.	1750.	DISTILLA	102.	0	0.36	0.36	0.38
34	GTRA12	GT-85RE-12	POWR	0.	154.	272.	103.	97.	29.	654.	0.	925.	DISTILLA	925.	0	0.14	0.11	0.71
34	GTRA12	GT-85RE-12	HEAT	0.	981.	1730.	659.	619.	182.	0.	-1631.	1730.	DISTILLA	98.	0	0.36	0.36	0.38
35	GTRA16	GT-85RE-16	POWR	0.	154.	279.	110.	97.	29.	646.	0.	925.	DISTILLA	925.	0	0.14	0.11	0.71
35	GTRA16	GT-85RE-16	HEAT	0.	927.	1675.	659.	585.	171.	0.	-1523.	1675.	DISTILLA	152.	0	0.36	0.35	0.39
36	GTR208	GT-60RE-08	POWR	0.	153.	304.	130.	97.	29.	622.	0.	926.	DISTILLA	926.	0	0.14	0.11	0.71
36	GTR208	GT-60RE-08	HEAT	0.	775.	1538.	659.	492.	144.	0.	-1234.	1538.	DISTILLA	304.	0	0.34	0.32	0.43
37	GTR212	GT-60RE-12	POWR	0.	152.	295.	121.	97.	29.	633.	0.	927.	DISTILLA	927.	0	0.14	0.10	0.71
37	GTR212	GT-60RE-12	HEAT	0.	825.	1603.	659.	529.	155.	0.	-1349.	1603.	DISTILLA	254.	0	0.34	0.33	0.41
38	GTR216	GT-60RE-16	POWR	0.	155.	289.	119.	97.	29.	636.	0.	924.	DISTILLA	924.	0	0.14	0.11	0.71
38	GTR216	GT-60RE-16	HEAT	0.	861.	1605.	659.	541.	158.	0.	-1366.	1605.	DISTILLA	219.	0	0.35	0.34	0.41
39	GTRW08	GT-85RE-08	POWR	0.	127.	2[illegible]7.	85.	97.	29.	675.	0.	952.	DISTILLA	952.	0	0.12	0.10	0.69
39	GTRW08	GT-85RE-08	HEAT	0.	983.	2143.	659.	752.	220.	0.	-2047.	2143.	DISTILLA	96.	0	0.31	0.35	0.31
40	GTRW12	GT-85RE-12	POWR	0.	134.	267.	83.	97.	29.	678.	0.	945.	DISTILLA	945.	0	0.12	0.10	0.70
40	GTRW12	GT-85RE-12	HEAT	0.	1068.	2132.	659.	776.	227.	0.	-2122.	2132.	DISTILLA	11.	0	0.33	0.36	0.31

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20461 MW 28.50 PROCESS MILLIONS BTU/HR 659.0 PROCESS TEMP(F) 250. PRODUCT WET-CORN-MIL HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	135.	272.	88.	97.	29.	672.	0.	944.	DISTILLA	944.	0	0.12	0.10	0.70
41 GTRW16 GT-85RE-16 HEAT	0.	1011.	2042.	659.	729.	214.	0.	-1975.	2042.	DISTILLA	68.	0	0.33	0.36	0.32
42 GTR308 GT-60RE-08 POWR	0.	123.	314.	113.	97.	29.	642.	0.	956.	DISTILLA	956.	0	0.11	0.10	0.69
42 GTR308 GT-60RE-08 HEAT	0.	718.	1826.	659.	566.	166.	0.	-1465.	1826.	DISTILLA	361.	0	0.28	0.31	0.36
43 GTR312 GT-60RE-12 POWR	0.	136.	284.	99.	97.	29.	659.	0.	944.	DISTILLA	944.	0	0.13	0.10	0.70
43 GTR312 GT-60RE-12 HEAT	0.	906.	1899.	659.	650.	190.	0.	-1726.	1899.	DISTILLA	173.	0	0.32	0.34	0.35
44 GTR316 GT-60RE-16 POWR	0.	135.	287.	100.	97.	29.	658.	0.	944.	DISTILLA	944.	0	0.12	0.10	0.70
44 GTR316 GT-60RE-16 HEAT	0.	887.	1888.	659.	640.	188.	0.	-1697.	1888.	DISTILLA	192.	0	0.32	0.34	0.35
45 FCPADS FUEL-CL-PH POWR	0.	99.	256.	44.	97.	29.	724.	0.	980.	DISTILLA	980.	0	0.09	0.10	0.67
45 FCPADS FUEL-CL-PH HEAT	0.	1502.	3876.	659.	1473.	432.	0.	-4299.	3876.	DISTILLA	-423.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	133.	236.	55.	97.	29.	711.	0.	947.	DISTILLA	947.	0	0.12	0.10	0.70
46 FCMCDS FUEL-CL-MO HEAT	0.	1588.	2828.	659.	1165.	342.	0.	-3338.	2828.	DISTILLA	-509.	0	0.36	0.41	0.23

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20631 MW 4.70 PROCESS MILLIONS BTU/HR 301.0 PROCESS TEMP(F) 250. PRODUCT BEET-SUGAR HOURS PER YEAR 2800.

POWER TO HEAT RATIO 0.053

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 76. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		76.	0.	0.	0.	0.	0.	354.	50.	354.	COAL-FGD	404.	0	0.	0.04	0.74
1	STM141	STM-TURB-1	POWR	76.	31.	82.	53.	16.	5.	291.	0.	373.	RESIDUAL	373.	10	0.10	0.04	0.81
1	STM141	STM-TURB-1	HEAT	76.	176.	461.	301.	90.	27.	0.	-233.	461.	RESIDUAL	228.	0	0.31	0.20	0.65
1	STM141	STM-TURB-1	POWR	76.	31.	82.	53.	16.	5.	291.	0.	373.	COAL-FGD	373.	10	0.10	0.04	0.81
1	STM141	STM-TURB-1	HEAT	76.	176.	461.	301.	90.	27.	0.	-233.	461.	COAL-FGD	228.	0	0.31	0.20	0.65
1	STM141	STM-TURB-1	POWR	76.	31.	82.	53.	16.	5.	291.	0.	373.	COAL-AFB	373.	10	0.10	0.04	0.81
1	STM141	STM-TURB-1	HEAT	76.	176.	461.	301.	90.	27.	0.	-233.	461.	COAL-AFB	228.	0	0.31	0.20	0.65
2	STM088	STM-TURB-8	POWR	76.	31.	98.	68.	16.	5.	275.	0.	373.	RESIDUAL	373.	10	0.10	0.04	0.81
2	STM088	STM-TURB-8	HEAT	76.	139.	438.	301.	71.	21.	0.	-173.	438.	RESIDUAL	265.	0	0.28	0.16	0.69
2	STM088	STM-TURB-8	POWR	76.	31.	98.	68.	16.	5.	275.	0.	373.	COAL-FGD	373.	10	0.10	0.04	0.81
2	STM088	STM-TURB-8	HEAT	76.	139.	438.	301.	71.	21.	0.	-173.	438.	COAL-FGD	265.	0	0.28	0.16	0.69
2	STM088	STM-TURB-8	POWR	76.	31.	98.	68.	16.	5.	275.	0.	373.	COAL-AFB	373.	10	0.10	0.04	0.81
2	STM088	STM-TURB-8	HEAT	76.	139.	438.	301.	71.	21.	0.	-173.	438.	COAL-AFB	265.	0	0.28	0.16	0.69
3	PFBSTM	PFB-STMTB-	POWR	76.	31.	62.	37.	16.	5.	311.	0.	373.	COAL-PFB	373.	10	0.09	0.04	0.81
3	PFBSTM	PFB-STMTB-	HEAT	76.	254.	511.	301.	131.	38.	0.	-360.	511.	COAL-PFB	151.	0	0.37	0.26	0.59
4	TISTMT	TI-STMTB-1	POWR	76.	31.	53.	29.	16.	5.	320.	0.	373.	RESIDUAL	373.	10	0.09	0.04	0.81
4	TISTMT	TI-STMTB-1	HEAT	76.	254.	437.	236.	132.	39.	76.	-364.	514.	RESIDUAL	150.	0	0.37	0.26	0.59
4	TISTMT	TI-STMTB-1	POWR	76.	31.	53.	29.	16.	5.	320.	0.	373.	COAL	373.	10	0.09	0.04	0.81
4	TISTMT	TI-STMTB-1	HEAT	76.	325.	557.	301.	169.	50.	0.	-478.	557.	COAL	80.	0	0.40	0.30	0.54
5	TIHRSG	THERMIONIC	POWR	76.	27.	114.	77.	16.	5.	263.	0.	377.	RESIDUAL	377.	0	0.08	0.04	0.80
5	TIHRSG	THERMIONIC	HEAT	76.	83.	348.	236.	49.	14.	76.	-103.	424.	RESIDUAL	321.	0	0.19	0.12	0.71
5	TIHRSG	THERMIONIC	POWR	76.	27.	114.	77.	16.	5.	263.	0.	377.	COAL	377.	0	0.08	0.04	0.80
5	TIHRSG	THERMIONIC	HEAT	76.	106.	444.	301.	62.	18.	0.	-145.	444.	COAL	299.	0	0.22	0.14	0.68
6	STIRL	STIRLING-1	POWR	76.	23.	58.	26.	16.	5.	323.	0.	381.	DISTILLA	381.	0	0.07	0.04	0.79
6	STIRL	STIRLING-1	HEAT	76.	207.	522.	236.	144.	42.	76.	-401.	598.	DISTILLA	198.	0	0.28	0.24	0.50

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20631 MW 4.70 PROCESS MILLIONS BTU/HR 301.0 PROCESS TEMP(F) 250. PRODUCT BEET-SUGAR HOURS PER YEAR 2800.

POWER TO HEAT RATIO 0.053

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 76. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	76.	23.	58.	26.	16.	5.	323.	0.	381.	RESIDUAL	381.	0	0.07	0.04	0.79
6 STIRL	STIRLING-1	HEAT	76.	207.	522.	236.	144.	42.	76.	-401.	598.	RESIDUAL	198.	0	0.28	0.24	0.50
6 STIRL	STIRLING-1	POWR	76.	23.	58.	26.	16.	5.	323.	0.	381.	COAL	381.	0	0.07	0.04	0.79
6 STIRL	STIRLING-1	HEAT	76.	264.	666.	301.	184.	54.	0.	-525.	666.	COAL	141.	0	0.31	0.28	0.45
7 HEGT85	HELIUM-GT-	POWR	76.	16.	50.	14.	16.	5.	338.	0.	388.	COAL-AFB	388.	10	0.05	0.04	0.78
7 HEGT85	HELIUM-GT-	HEAT	76.	358.	1107.	301.	355.	104.	0.	-1061.	1107.	COAL-AFB	47.	0	0.26	0.32	0.27
8 HEGT60	HELIUM-GT-	POWR	76.	16.	62.	24.	5.	5.	326.	0.	388.	COAL-AFB	388.	10	0.05	0.04	0.78
8 HEGT60	HELIUM-GT-	HEAT	76.	203.	792.	301.	205.	60.	0.	-591.	792.	COAL-AFB	201.	0	0.22	0.26	0.38
9 HEGT00	HELIUM-GT-	POWR	76.	15.	91.	47.	16.	5.	299.	0.	390.	COAL-AFB	390.	10	0.04	0.04	0.77
9 HEGT00	HELIUM-GT-	HEAT	76.	93.	580.	301.	102.	30.	0.	-269.	580.	COAL-AFB	311.	10	0.16	0.18	0.52
10 FCMCCL	FUEL-CL-MO	POWR	0.	27.	53.	25.	16.	5.	325.	0.	377.	COAL	377.	10	-0.15	0.04	0.80
10 FCMCCL	FUEL-CL-MO	HEAT	0.	322.	633.	301.	192.	56.	0.	-551.	633.	COAL	82.	10	0.28	0.30	0.48
11 FCSTCL	FUEL-CL-ST	POWR	0.	28.	39.	14.	16.	5.	337.	0.	376.	COAL	376.	10	-0.15	0.04	0.80
11 FCSTCL	FUEL-CL-ST	HEAT	0.	593.	822.	301.	340.	100.	0.	-1011.	822.	COAL	-189.	10	0.39	0.41	0.37
12 IGGTST	INT-GAS-GT	POWR	0.	23.	51.	20.	16.	5.	331.	0.	381.	COAL	381.	10	-0.16	0.04	0.79
12 IGGTST	INT-GAS-GT	HEAT	0.	348.	767.	301.	243.	71.	0.	-711.	767.	COAL	56.	10	0.26	0.32	0.39
13 GTSOAR	GT-HRSG-10	POWR	76.	24.	55.	25.	16.	5.	325.	0.	380.	RESIDUAL	380.	10	0.07	0.04	0.79
13 GTSOAR	GT-HRSG-10	HEAT	76.	229.	519.	236.	150.	44.	76.	-420.	595.	RESIDUAL	175.	0	0.31	0.25	0.51
14 GTAC08	GT-HRSG-08	POWR	76.	26.	59.	30.	16.	5.	319.	0.	378.	RESIDUAL	378.	10	0.08	0.04	0.80
14 GTAC08	GT-HRSG-08	HEAT	76.	205.	464.	236.	125.	37.	76.	-341.	540.	RESIDUAL	199.	0	0.31	0.23	0.56
15 GTAC12	GT-HRSG-12	POWR	76.	27.	53.	25.	16.	5.	325.	0.	377.	RESIDUAL	377.	10	0.08	0.04	0.80
15 GTAC12	GT-HRSG-12	HEAT	76.	254.	499.	236.	152.	45.	76.	-426.	576.	RESIDUAL	150.	0	0.34	0.26	0.52
16 GTAC16	GT-HRSG-16	POWR	76.	27.	50.	22.	16.	5.	328.	0.	378.	RESIDUAL	378.	10	0.08	0.04	0.80
16 GTAC16	GT-HRSG-16	HEAT	76.	283.	526.	236.	170.	50.	76.	-481.	602.	RESIDUAL	122.	0	0.35	0.28	0.50
17 GTWC16	GT-HRSG-16	POWR	76.	23.	51.	21.	16.	5.	330.	0.	381.	RESIDUAL	381.	10	0.07	0.04	0.79
17 GTWC16	GT-HRSG-16	HEAT	76.	269.	585.	236.	184.	54.	76.	-526.	662.	RESIDUAL	136.	0	0.31	0.28	0.45

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20631 MW 4.70 PROCESS MILLIONS BTU/HR 301.0 PROCESS TEMP(F) 250. PRODUCT BEET-SUGAR HOURS PER YEAR 2000.

POWER TO HEAT RATIO 0.053

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 76. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	76.	24.	40.	11.	16.	5.	341.	0.	381.	RESIDUAL	381.	10	0.07	0.04	0.79
18 CC1626 GTST-16/26 HEAT	76.	487.	824.	236.	331.	97.	76.	-984.	901.	RESIDUAL	-83.	0	0.37	0.37	0.33
19 CC1622 GTST-16/22 POWR	76.	25.	40.	13.	16.	5.	339.	0.	380.	RESIDUAL	380.	10	0.08	0.04	0.79
19 CC1622 GTST-16/22 HEAT	76.	460.	750.	236.	298.	87.	76.	-883.	827.	RESIDUAL	-56.	0	0.38	0.36	0.36
20 CC1222 GTST-12/22 POWR	76.	25.	40.	13.	16.	5.	339.	0.	379.	RESIDUAL	379.	10	0.08	0.04	0.79
20 CC1222 GTST-12/22 HEAT	76.	464.	746.	236.	298.	87.	76.	-882.	822.	RESIDUAL	-60.	0	0.38	0.36	0.37
21 CC0822 GTST-08/22 POWR	76.	27.	42.	16.	16.	5.	336.	0.	378.	RESIDUAL	378.	10	0.08	0.04	0.80
21 CC0822 GTST-08/22 HEAT	76.	401.	630.	236.	241.	71.	76.	703.	707.	RESIDUAL	4.	0	0.39	0.34	0.43
22 STIG15 STIG-15-16 POWR	76.	9.	42.	1.	16.	5.	353.	0.	396.	RESIDUAL	396.	10	0.03	0.04	0.76
22 STIG15 STIG-15-16 HEAT	76.	3739	18154.	236.	6917.	2027.	76.	-21564.	18230.	RESIDUAL	-3334.	0	0.17	0.38	0.02
23 STIG10 STIG-10-16 POWR	76.	12.	45.	6.	16.	5.	347.	0.	392.	RESIDUAL	392.	10	0.04	0.04	0.77
23 STIG10 STIG-10-16 HEAT	76.	495.	1781.	236.	640.	187.	76.	-1949.	1858.	RESIDUAL	-91.	0	0.22	0.34	0.16
24 STIG1S STIG-1S-16 POWR	76.	14.	48.	10.	16.	5.	342.	0.	390.	RESIDUAL	390.	10	0.04	0.04	0.77
24 STIG1S STIG-1S-16 HEAT	76.	331.	1120.	236.	375.	110.	76.	-1123.	1196.	RESIDUAL	73.	0	0.23	[illegible]	0.25
25 DEADV3 DIESEL-ADV POWR	76.	20.	43.	11.	16.	5.	341.	0.	384.	RESIDUAL	384.	0	0.06	0.04	0.78
25 DEADV3 DIESEL-ADV HEAT	76.	426.	929.	236.	345.	101.	76.	-1027.	1005.	RESIDUAL	-21.	0	0.31	0.34	0.30
26 DEADV2 DIESEL-ADV POWR	76.	20.	43.	11.	16.	5.	341.	0.	384.	RESIDUAL	384.	1	0.06	0.04	0.78
26 DEADV2 DIESEL-ADV HEAT	76.	426.	929.	236.	345.	101.	76.	-1027.	1006.	RESIDUAL	-21.	1	0.31	0.34	0.30
27 DEADV1 DIESEL-ADV POWR	76.	27.	43.	17.	16.	5.	334.	0.	377.	RESIDUAL	377.	1	0.08	0.04	0.80
27 DEADV1 DIESEL-ADV HEAT	76.	374.	604.	236.	224.	66.	76.	-650.	680.	RESIDUAL	30.	1	0.38	0.33	0.44
28 DEHTPM ADV-DIESEL POWR	76.	29.	44.	19.	16.	5.	331.	0.	375.	RESIDUAL	375.	0	0.09	0.04	0.80
28 DEHTPM ADV-DIESEL HEAT	76.	353.	537.	236.	196.	57.	76.	-562.	613.	RESIDUAL	51.	0	0.40	0.32	0.49
29 DESOA3 DIESEL-SOA POWR	76.	17.	44.	10.	16.	5.	343.	0.	387.	DISTILLA	387.	0	0.05	0.04	0.78
29 DESOA3 DIESEL-SOA HEAT	76.	415.	1072.	236.	387.	113.	76.	-1160.	1149.	DISTILLA	-11.	0	0.28	0.34	0.26
29 DESOA3 DIESEL-SOA POWR	76.	17.	44.	10.	16.	5.	343.	0.	387.	RESIDUAL	387.	0	0.05	0.04	0.78
29 DESOA3 DIESEL-SOA HEAT	76.	415.	1072.	236.	387.	113.	76.	-1160.	1149.	RESIDUAL	-11.	0	0.28	0.34	0.26

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20631 MW 4.70 PROCESS MILLIONS BTU/HR 301.0 PROCESS TEMP(F) 250. PRODUCT BEET-SUGAR HOURS PER YEAR 2800.

POWER TO HEAT RATIO 0.053

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 76. HOT WATER BTU*10**6= 0

No.	ECS	System	Mode	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	76.	17.	44.	10.	16.	5.	343.	0.	387.	DISTILLA	387.	1	0.05	0.04	0.78
30	DESOA2	DIESEL-SOA	HEAT	76.	415	1073.	236.	387.	113.	76.	-1160.	1149.	DISTILLA	-11.	1	0.28	0.34	0.26
30	DESOA2	DIESEL-SOA	POWR	76.	17.	44.	10.	16.	5.	343.	0.	387.	RESIDUAL	387.	1	0.05	0.04	0.78
30	DESOA2	DIESEL-SOA	HEAT	76.	415.	1073.	236.	387.	113.	76.	-1160.	1149.	RESIDUAL	-11.	1	0.28	0.34	0.26
31	DESOA1	DIESEL-SOA	POWR	76.	27.	44.	18.	16.	5.	333.	0.	378.	DISTILLA	378.	1	0.08	0.04	0.80
31	DESOA1	DIESEL-SOA	HEAT	76.	353.	589.	236.	212.	62.	76.	-614.	665	DISTILLA	51.	1	0.37	0.32	0.45
31	DESOA1	DIESEL-SOA	POWR	76.	27.	44.	18.	16.	5.	333.	0.	378.	RESIDUAL	378.	1	0.08	0.04	0.80
31	DESOA1	DIESEL-SOA	HEAT	76.	353.	589.	236.	212.	62.	76.	-614.	665.	RESIDUAL	51.	1	0.37	0.32	0.45
32	GTSOAD	GT-HRSG-10	POWR	76.	26.	55.	26.	16.	5.	323.	0.	378.	DISTILLA	378.	10	0.08	0.04	0.80
32	GTSOAD	GT-HRSG-10	HEAT	76.	234.	496.	236.	145.	42.	76.	-402.	572.	DISTILLA	170.	0	0.32	0.25	0.53
33	GTRA08	GT-85RE-08	POWR	76.	25.	45.	17.	16.	[illegible]	334.	0.	379.	DISTILLA	379.	10	0.08	0.04	0.79
33	GTRA08	GT-85RE-08	HEAT	76.	350.	627.	236.	224.	66.	76.	-649.	703.	DISTILLA	54.	0	0.36	0.32	0.43
34	GTRA12	GT-85RE-12	POWR	76.	25.	45.	17.	16.	5.	334.	0.	379.	DISTILLA	379.	10	0.08	0.04	0.79
34	GTRA12	GT-85RE-12	HEAT	76.	351.	620.	236.	222.	65.	76.	-643.	696.	DISTILLA	53.	0	0.36	0.32	0.43
35	GTRA16	GT-85RE-16	POWR	76.	25.	46.	18.	16.	5.	333.	0.	379.	DISTILLA	379.	10	0.08	0.04	0.79
35	GTRA16	GT-85RE-16	HEAT	76.	332.	600.	236.	209.	61.	76.	-604.	676.	DISTILLA	72.	0	0.36	0.31	0.44
36	GTR208	GT-60RE-08	POWR	76.	25.	50.	21.	16.	5.	329.	0.	379.	DISTILLA	379.	10	0.08	0.04	0.79
36	GTR208	GT-60RE-08	HEAT	76.	278.	551.	236.	176.	52.	76.	-501.	627.	DISTILLA	127.	0	0.34	0.28	0.48
37	GTR212	GT-60RE-12	POWR	76.	25.	49.	20.	16.	5.	331.	0.	379.	DISTILLA	379.	10	0.08	0.04	0.79
37	GTR212	GT-60RE-12	HEAT	76.	296.	574.	236.	189.	56.	76.	-542.	650.	DISTILLA	109.	0	0.34	0.29	0.46
38	GTR216	GT-60RE-16	POWR	76.	26.	48.	20.	16.	5.	331.	0.	379.	DISTILLA	379.	10	0.08	0.04	0.79
38	GTR216	GT-60RE-16	HEAT	76.	308.	575.	236.	194.	57.	76.	-555.	651.	DISTILLA	96.	0	0.35	0.30	0.46
39	GTRW08	GT-85RE-08	POWR	76.	21.	46.	14.	16.	5.	338.	0.	383.	DISTILLA	383.	10	0.06	0.04	0.79
39	GTRW08	GT-85RE-08	HEAT	76.	352.	767.	236.	269.	79.	76.	-792.	844.	DISTILLA	52.	0	0.31	0.32	0.36
40	GTRW12	GT-85RE-12	POWR	76.	22.	44.	14.	16.	5.	338.	0.	382.	DISTILLA	382.	10	0.07	0.04	0.79
40	GTRW12	GT-85RE-12	HEAT	76.	383.	764.	236.	278.	81.	76.	-818.	840.	DISTILLA	22.	0	0.33	0.33	0.36

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20631 MW 4.70 PROCESS MILLIONS BTU/HR 301.0 PROCE 3 TEMP(F) 250. PRODUCT BEET-SUGAR HOURS PER YEAR 2800.

POWER TO HEAT RATIO 0.053

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 76. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**5 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	76.	22.	45.	14.	16.	5.	337.	0.	382.	DISTILLA	382.	10	0.07	0.04	0.79
41 GTRW16 GT-85RE-16 HEAT	76.	362.	731.	236.	261.	77.	76.	-766.	808.	DISTILLA	42.	0	0.33	0.32	0.37
42 GTR308 GT-60RE-08 POWR	76.	20.	52.	19.	16.	5.	332.	0.	394.	DISTILLA	384.	10	0 06	0.04	0.78
42 GTR308 GT-60RE-08 HEAT	76.	257.	654.	236.	203.	59.	76.	-583.	730.	DISTILLA	147.	0	0.28	0.28	0.41
43 GTR312 GT-6ORE-12 POWR	76.	22.	47.	16.	16.	5.	335.	0.	382.	DISTILLA	382.	10	0.07	0.01	0.72
43 GTR312 GT-CORE-12 HEAT	76.	324.	680.	236.	233.	68.	76.	-677.	757.	DISTILLA	80.	0	0.32	0.31	0.40
44 GTR316 GT-6ORE-16 POWR	76.	22.	47.	17.	16.	5.	335.	0.	382.	DISTILLA	382.	10	0.07	0.01	0.79
44 GTR316 GT-6ORE-16 HEAT	76.	318.	676.	236.	229.	67.	76.	-668.	753.	DISTILLA	86.	0	0.32	0.30	0.40
45 FCPADS FUEL-CL-PH POWR	76.	16.	42.	7.	16.	5.	346.	0.	388.	DISTILLA	388.	0	0.05	0.04	0.78
45 FCPADS FUEL-CL-PH HEAT	76.	538.	1388.	236.	528.	155.	76.	-1598.	1465.	DISTILLA	-134.	0	0.28	0.30	0.21
46 FCMCDS FUEL-CL-MO POWR	76.	22.	39.	9.	16.	5.	343.	0.	382.	DISTILLA	382.	0	0.07	0.04	0.79
46 FCMCDS FUEL-CL-MO HEAT	76.	569.	1013.	236.	417.	122.	76.	-1254.	1089.	DISTILLA	-165.	0	0.36	0.38	0.28

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20821 MW 6.04 PROCESS MILLIONS BTU/HR 86.0 PROCESS TEMP(F) 250. PRODUCT MALT-BEVERAG HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.240

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 52.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	101.	64.	101.	COAL-AFB	166.	0	0.	0.12	0.52
1 STM141 STM-TURB-1 POWR	0.	40.	105.	69.	21.	6.	21.	0.	125.	RESIDUAL	125.	10	0.24	0.16	0.69
1 STM141 STM-TURB-1 HEAT	0.	50.	132.	86.	26.	8.	0.	-16.	132.	RESIDUAL	115.	0	0.28	0.20	0.65
1 STM141 STM-TURB-1 POWR	0.	40.	105.	69.	21.	6.	21.	0.	125.	COAL-FGD	125.	10	0.24	0.16	0.69
1 STM141 STM-TURB-1 HEAT	0.	50.	132.	86.	26.	8.	0.	-16.	132.	COAL-FGD	115.	0	0.28	0.20	0.65
1 STM141 STM-TURB-1 POWR	0.	40.	105.	69.	21.	6.	21.	0.	125.	COAL-AFB	125.	10	0.24	0.16	0.69
1 STM141 STM-TURB-1 HEAT	0.	50.	132.	86.	26.	8.	0.	-16.	132.	COAL-AFB	115.	0	0.28	0.20	0.65
2 STM088 STM-TURB-8 POWR	0.	39.	126.	87.	21.	6.	-1.	0.	126.	RESIDUAL	126.	0	0.24	0.16	0.68
2 STM088 STM-TURB-8 HEAT	0.	40.	125.	86.	20.	6.	0.	1.	125.	RESIDUAL	126.	0	0.24	0.16	0.68
2 STM088 STM-TURB-8 POWR	0.	39.	126.	87.	21.	6.	-1.	0.	126.	COAL-FGD	126.	0	0.24	0.16	0.68
2 STM088 STM-TURB-8 HEAT	0.	40.	125.	86.	20.	6.	0.	1.	125.	COAL-FGD	126.	0	0.24	0.16	0.68
2 STM088 STM-TURB-8 POWR	0.	39.	126.	87.	21.	6.	-1.	0.	126.	COAL-AFB	126.	0	0.24	0.16	0.68
2 STM088 STM-TURB-8 HEAT	0.	40.	125.	86.	20.	6.	0.	1.	125.	COAL-AFB	126.	0	0.24	0.16	0.68
3 PFBSTM PFB-STMTB- POWR	0.	40.	80.	47.	21.	6.	46.	0.	126.	COAL-PFB	126.	10	0.24	0.16	0.68
3 PFBSTM PFB-STMTB- HEAT	0.	72.	146.	86.	38.	11.	0.	-53.	146.	COAL-PFB	93.	10	0.33	0.26	0.59
4 TISTMT TI-STMTB-1 POWR	0.	40.	68.	37.	21.	6.	58.	0.	126.	RESIDUAL	126.	10	0.24	0.16	0.68
4 TISTMT TI-STMTB-1 HEAT	0.	93.	159.	86.	48.	14.	0.	-86.	159.	RESIDUAL	73.	0	0.37	0.30	0.54
4 TISTMT TI-STMTB-1 POWR	0.	40.	68.	37.	21.	6.	58.	0.	126.	COAL	126.	10	0.24	0.16	0.68
4 TISTMT TI-STMTB-1 HEAT	0.	93.	159.	86.	48.	14.	0.	-86.	159.	COAL	73.	0	0.37	0.30	0.54
5 TIHRSG THERMIONIC POWR	0.	19.	146.	99.	21.	6.	-16.	0.	146.	RESIDUAL	146.	0	0.12	0.14	0.59
5 TIHRSG THERMIONIC HEAT	0.	30.	127.	86.	18.	5.	0.	9.	127.	RESIDUAL	135.	0	0.18	0.13	0.64
5 TIHRSG THERMIONIC POWR	0.	19.	146.	99.	21.	6.	-16.	0.	146.	COAL	146.	0	0.12	0.14	0.59
5 TIHRSG THERMIONIC HEAT	0.	30.	127.	86.	18.	5.	0.	9.	127.	COAL	135.	0	0.18	0.13	0.64
6 STIRL STIRLING-1 POWR	0.	34.	65.	30.	21.	6.	66.	0.	132.	DISTILLA	132.	0	0.20	0.16	0.65
6 STIRL STIRLING-1 HEAT	0	98.	190.	86.	60.	18.	0.	-122.	190.	DISTILLA	67.	0	0.34	0.32	0.45

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20821 MW 6.04 PROCESS MILLIONS BTU/HR 86.0 PROCESS TEMP(F) 250. PRODUCT MALT-BEVERAG HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.240

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 52.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	34.	65.	30.	21.	6.	66.	0.	132.	RESIDUAL	132.	0	0.20	0.16	0.65
6	STIRL	STIRLING-1	HEAT	0.	98.	190.	86.	60.	18.	0.	-122.	190.	RESIDUAL	67.	0	0.34	0.32	0.45
6	STIRL	STIRLING-1	POWR	0.	34.	65.	30.	21.	6.	66.	0.	132.	COAL	132.	0	0.20	0.16	0.65
6	STIRL	STIRLING-1	HEAT	0.	98.	190.	86.	60.	18.	0.	-122.	190.	COAL	67.	0	0.34	0.32	0.45
7	HEGT85	HELIUM-GT-	POWR	0.	33.	64.	28.	21.	6.	69.	0.	133.	COAL-AFB	133.	10	0.20	0.15	0.65
7	HEGT85	HELIUM-GT-	HEAT	0.	102.	201.	86.	64.	19.	0.	-137.	201.	COAL-AFB	64.	10	0.34	0.32	0.43
8	HEGT60	HELIUM-GT-	POWR	0.	20.	80.	30.	21.	6.	66.	0.	145.	COAL-AFB	145.	10	0.12	0.14	0.59
8	HEGT60	HELIUM-GT-	HEAT	0.	58.	226.	86.	59.	17.	0.	-119.	226.	COAL-AFB	108.	10	0.20	0.26	0.38
9	HEGT00	HELIUM-GT-	POWR	0.	19.	117.	61.	21.	6.	30.	0.	147.	COAL-AFB	147.	10	0.11	0.14	0.59
9	HEGT00	HELIUM-GT-	HEAT	0.	27.	166.	86.	29.	9.	0.	-27.	166.	COAL-AFB	139.	10	0.14	0.18	0.52
10	FCMCCL	FUEL-CL-MO	POWR	0.	35.	68.	32.	21.	6.	63.	0.	131.	COAL	131.	10	0.21	0.16	0.66
10	FCMCCL	FUEL-CL-MO	HEAT	0.	92.	181.	86.	55.	16.	0.	-107.	181.	COAL	73.	10	0.34	0.30	0.48
11	FCSTCL	FUEL-CL-ST	POWR	0.	36.	50.	18.	21.	6.	80.	0.	130.	COAL	130.	10	0.22	0.16	0.66
11	FCSTCL	FUEL-CL-ST	HEAT	0.	169.	235.	86.	97.	28.	0.	-239.	235.	COAL	-4.	10	0.42	0.41	0.37
12	IGGTST	INT-GAS-GT	POWR	0.	29.	65.	25.	21.	6.	71.	0.	136.	COAL	136.	10	0.18	0.15	0.63
12	IGGTST	INT-GAS-GT	HEAT	0.	99.	219.	86.	70.	20.	0.	-153.	219.	COAL	66.	10	0.31	0.32	0.39
13	GTSOAR	GT-HRSG-10	POWR	0.	31.	71.	32.	21.	6.	63.	0.	134.	RESIDUAL	134.	10	0.19	0.15	0.64
13	GTSOAR	GT-HRSG-10	HEAT	0.	83.	189.	86.	55.	16.	0.	-107.	189.	RESIDUAL	82.	0	0.31	0.29	0.45
14	GTAC08	GT-HRSG-08	POWR	0.	34.	76.	39.	21.	6.	55.	0.	132.	RESIDUAL	132.	10	0.20	0.16	0.65
14	GTAC08	GT-HRSG-08	HEAT	0.	75.	169.	86.	46.	13.	0.	-78.	169.	RESIDUAL	91.	10	0.31	0.27	0.51
15	GTAC12	GT-HRSG-12	POWR	0.	34.	68.	32.	21.	6.	64.	0.	131.	RESIDUAL	131.	10	0.21	0.16	0.66
15	GTAC12	GT-HRSG-12	HEAT	0.	93.	182.	86.	56.	16.	0.	-109.	182.	RESIDUAL	73.	0	0.34	0.31	0.47
16	GTAC16	GT-HRSG-16	POWR	0.	34.	64.	29.	21.	6.	67.	0.	131.	RESIDUAL	131.	10	0.21	0.16	0.66
16	GTAC16	GT-HRSG-16	HEAT	0.	103.	192.	86.	62.	18.	0.	-129.	192.	RESIDUAL	63.	0	0.35	0.32	0.45
17	GTWC16	GT-HRSG-16	POWR	0.	30.	65.	26.	21.	6.	70.	0.	136.	RESIDUAL	136.	10	0.18	0.15	0.63
17	GTWC16	GT-HRSG-16	HEAT	0.	98.	213.	86.	67.	20.	0.	-145.	213.	RESIDUAL	68.	10	0.31	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20821 MW 6.04 PROCESS MILLIONS BTU/HR 86.0 PROCESS TEMP(F) 250. PRODUCT MALT-BEVERAG HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.240

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 52.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**5 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	F L	FESR	POWER FACTR	HEAT FACTR
18	CC1626 GTST-16/26	POWR	0.	30.	51.	15.	21.	6.	84.	0.	135.	RESIDUAL	135.	10	0.18	0.15	0.64
18	CC1626 GTST-16/26	HEAT	0.	178.	300.	86.	121.	35.	0.	-312.	300.	RESIDUAL	-12.	0	0.37	0.40	0.29
19	CC1622 GTST-16/22	POWR	0.	32.	52.	16.	21.	6.	82.	0.	134.	RESIDUAL	134.	10	0.19	0.15	0.64
19	CC1622 GTST-16/22	HEAT	0.	168.	273.	86.	109.	32.	0.	-275.	273.	RESIDUAL	-2.	0	0.38	0.40	0.31
20	CC1222 GTST-12/22	POWR	0.	32.	52.	16.	21.	6.	82.	0.	134.	RESIDUAL	134.	10	0.19	0.15	0.64
20	CC1222 GTST-12/22	HEAT	0.	169.	272.	86.	109.	32.	0.	-275.	272.	RESIDUAL	-3.	0	0.38	0.40	0.32
21	CC0822 GTST-08/22	POWR	0.	34.	54.	20.	21.	6.	77.	0.	131.	RESIDUAL	131.	10	0.21	0.16	0.65
21	CC0822 GTST-08/22	HEAT	0.	146.	230.	86.	88.	26.	0.	-210.	230.	RESIDUAL	20.	0	0.39	0.38	0.37
22	STIG15 STIG-15-16	POWR	0.	11.	54.	1.	21.	6.	100.	0.	154.	RESIDUAL	154.	10	0.07	0.13	0.56
22	STIG15 STIG-15-16	HEAT	0.	1362.	6615.	86.	2520.	739.	0.	-7812.	6615.	RESIDUAL	-1197.	0	0.17	0.38	0.01
23	STIG10 STIG-10-16	POWR	0.	16.	57.	8.	21.	6.	92.	0.	150.	RESIDUAL	150.	10	0.10	0.14	0.57
23	STIG10 STIG-10-16	HEAT	0.	180.	649.	86.	233.	68.	0.	-664.	649.	RESIDUAL	-15.	0	0.22	0.36	0.13
24	STIG1S STIG-1S-16	POWR	0.	18.	61.	13.	21.	6.	86.	0.	147.	RESIDUAL	147.	10	0.11	0.14	0.58
24	STIG1S STIG-1S-16	HEAT	0.	121.	408.	86.	137.	40.	0.	-363.	408.	RESIDUAL	45.	0	0.23	0.34	0.21
25	DEADV3 DIESEL-ADV	POWR	0.	33.	56.	21.	21.	6.	77.	0.	132.	RESIDUAL	132.	0	0.20	0.16	0.65
25	DEADV3 DIESEL-ADV	HEAT	0.	138.	231.	86.	86.	25.	0.	-203.	231.	RESIDUAL	28.	0	0.37	0.37	0.37
26	DEADV2 DIESEL-ADV	POWR	0.	33.	56.	21.	21.	6.	77.	0.	132.	RESIDUAL	132.	1	0.20	0.16	0.65
26	DEADV2 DIESEL-ADV	HEAT	0.	138.	231.	86.	86.	25.	0.	-203.	231.	RESIDUAL	28.	1	0.37	0.37	0.37
27	DEADV1 DIESEL-ADV	POWR	0.	37.	56.	24.	21.	6.	73.	0.	129.	RESIDUAL	129.	1	0.22	0.16	0.67
27	DEADV1 DIESEL-ADV	HEAT	0.	133.	202.	86.	75.	22.	0.	-169.	202.	RESIDUAL	32.	1	0.40	0.37	0.43
28	DEHTPM ADV-DIESEL	POWR	0.	37.	56.	25.	21.	6.	72.	0.	128.	RESIDUAL	128.	0	0.22	0.16	0.67
28	DEHTPM ADV-DIESEL	HEAT	0.	129.	196.	86.	71.	21.	0.	-159.	196.	RESIDUAL	37.	0	0.40	0.37	0.44
29	DESOA3 DIESEL-SOA	POWR	0.	32.	57.	21.	21.	6.	77.	0.	134.	DISTILLA	134.	0	0.19	0.15	0.64
29	DESOA3 DIESEL-SOA	HEAT	0.	131.	235.	86.	85.	25.	0.	-201.	235.	DISTILLA	34.	0	0.36	0.36	0.37
29	DESOA3 DIESEL-SOA	POWR	0.	32.	57.	21.	21.	6.	77.	0.	134.	RESIDUAL	134.	0	0.19	0.15	0.64
29	DESOA3 DIESEL-SOA	HEAT	0.	131.	235.	86.	85.	25.	0.	-201.	235.	RESIDUAL	34.	0	0.36	0.36	0.37

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20821 MW 6.04 PROCESS MILLIONS BTU/HR 86.0 PROCESS TEMP(F) 250. PRODUCT MALT-BEVERAG HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.240

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 52.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	32.	57.	21.	21.	6.	77.	0.	134.	DISTILLA	134.	1	0.19	0.15	0.64
30 DESOA2 DIESEL-SOA HEAT	0.	131.	235.	86.	85.	25.	0.	-201.	235.	DISTILLA	34.	1	0.36	0.38	0.37
30 DESOA2 DIESEL-SOA POWR	0.	32.	57.	21.	21.	6.	77.	0.	134.	RESIDUAL	134.	1	0.19	0.15	0.64
30 DESOA2 DIESEL-SOA HEAT	0.	131.	235.	86.	85.	25.	0.	-201.	235.	RESIDUAL	34.	1	0.36	0.36	0.37
31 DESOA1 DIESEL-SOA POWR	0.	37.	57.	25.	21.	6.	72.	0.	129.	DISTILLA	129.	1	0.22	0.16	0.67
31 DESOA1 DIESEL-SOA HEAT	0.	126.	197.	86.	71.	21.	0.	-158.	197.	DISTILLA	39.	1	0.39	0.36	0.44
31 DESOA1 DIESEL-SOA POWR	0.	37.	57.	25.	21	6.	72.	0.	129.	RESIDUAL	129.	1	0.22	0.16	0.67
31 DESOA1 DIESEL-SOA HEAT	0.	126.	197.	86.	71.	21.	0.	-158.	197.	RESIDUAL	39.	1	0.39	0.36	0.44
32 GTSOAD GT-HRSG-10 POWR	0.	33.	71.	34.	21.	6.	62.	0.	132.	DISTILLA	132.	10	0.20	0.18	0.65
32 GTSOAD GT-HRSG-10 HEAT	0.	85.	181.	86.	53.	15.	0.	-100.	181.	DISTILLA	80.	0	0.32	0.29	0.48
33 GTRA08 GT-85RE-08 POWR	0.	32.	58.	22.	21.	6.	76.	0.	133.	DISTILLA	133.	10	0.19	0.15	0.65
33 GTRA08 GT-85RE-08 HEAT	0.	128.	228.	86.	82.	24.	0.	-190.	228.	DISTILLA	38.	0	0.36	0.36	0.38
34 GTRA12 GT-85RE-12 POWR	0.	33.	58.	22.	21.	6.	75.	0.	133.	DISTILLA	133.	10	0.20	0.16	0.65
34 GTRA12 GT-85RE-12 HEAT	0.	128.	226.	86.	81.	24.	0.	-188.	226.	DISTILLA	38.	0	0.36	0.36	0.38
35 GTRA16 GT-85RE-16 POWR	0.	33.	59.	23.	21.	6.	74.	0.	133.	DISTILLA	133.	10	0.20	0.16	0.65
35 GTRA16 GT-85RE-16 HEAT	0.	121.	219.	86.	76.	22.	0.	-174.	219.	DISTILLA	45.	0	0.36	0.35	0.39
36 GTR208 GT-60RE-08 POWR	0.	32.	64.	28.	21.	6.	69.	0.	133.	DISTILLA	133.	10	0.20	0.15	0.65
36 GTR208 GT-60RE-08 HEAT	0.	101.	201.	86.	64.	19.	0.	-136.	201.	DISTILLA	64.	0	0.34	0.32	0.43
37 GTR212 GT-60RE-12 POWR	0.	32.	62.	26.	21.	6.	71.	0.	133.	DISTILLA	133.	10	0.19	0.15	0.64
37 GTR212 GT-60RE-12 HEAT	0.	108.	209.	86.	69.	20.	0.	-151.	209.	DISTILLA	58.	0	0.34	0.33	0.41
38 GTR216 GT-60RE-16 POWR	0.	33.	61.	25.	21.	6.	72.	0.	133.	DISTILLA	133.	10	0.20	0.16	0.65
38 GTR216 GT-60RE-16 HEAT	0.	112.	209.	86.	71.	21	0.	-156.	209.	DISTILLA	53.	0	0.35	0.34	0.41
39 GTRW08 GT-85RE-08 POWR	0.	27.	59.	18.	21.	6.	80.	0.	139.	DISTILLA	139.	10	0.16	0.15	0.62
39 GTRW08 GT-85RE-08 HEAT	0.	128.	280.	86.	98.	29.	0.	-242.	280.	DISTILLA	37.	0	0.31	0.35	0.31
40 GTRW12 GT-85RE-12 POWR	0.	28.	57.	17.	21.	6.	81.	0.	137.	DISTILLA	137.	10	0.17	0.15	0.63
40 GTRW12 GT-85RE-12 HEAT	0.	139.	278.	86.	101.	30.	0.	-252.	278.	DISTILLA	26.	0	0.33	0.36	0.31

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20821 MW 6.04 PROCESS MILLIONS BTU/HR 86.0 PROCESS TEMP(F) 250. PRODUCT MALT-BEVERAG HOURS PER YEAR 6600.

POWER TO HEAT RATIO 0.240

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 52.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	29.	58.	19.	21.	6.	79.	0.	137.	DISTILLA	137.	10	0.17	0.15	0.63
41 GTRW16 GT-85RE-16 HEAT	0.	132.	267.	86.	95.	28.	0.	-233.	267.	DISTILLA	34.	0	0.33	0.38	0.32
42 GTR308 GT-60RE-08 POWR	0.	26.	66.	24.	21.	6.	73.	0.	139.	DISTILLA	139.	10	0.16	0.15	0.62
42 GTR308 GT-60RE-08 HEAT	0.	94.	238.	86.	74.	22.	0.	-166.	238.	DISTILLA	72.	0	0.28	0.31	0.36
43 GTR312 GT-60RE-12 POWR	0.	29.	60.	21.	21.	6.	77.	0.	137.	DISTILLA	137.	10	0.17	0.15	0.63
43 GTR312 GT-60RE-12 HEAT	0.	118.	248.	86.	85.	25.	0.	-201.	248	DISTILLA	47.	0	0.32	0.34	0.35
44 GTR316 GT-60RE-16 POWR	0.	29.	61.	21.	21.	6.	76.	0.	137.	DISTILLA	137.	10	0.17	0.15	0.63
44 GTR316 GT-60RE-16 HEAT	0.	116.	246.	86.	84.	24.	0.	-197.	246.	DISTILLA	50.	0	0.32	0.34	0.35
45 FCPADS FUEL-CL-PH POWR	0.	33.	54.	19.	21.	6.	78.	0.	133.	DISTILLA	133.	0	0.20	0.16	0.65
45 FCPADS FUEL-CL-PH HEAT	0.	146.	240.	86.	91.	27.	0.	-221.	240	DISTILLA	19.	0	0.38	0.38	0.36
46 FCMCDS FUEL-CL-MO POWR	0.	28.	50.	12.	21.	6.	87.	0.	137.	DISTILLA	137.	0	0.17	0.15	0.63
46 FCMCDS FUEL-CL-MO HEAT	0.	207.	369.	86.	152.	45.	0.	-411.	369.	DISTILLA	-42.	0	0.36	0.41	0.23

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 22601 MW 6.20 PROCESS MILLIONS BTU/HR 158.0 PROCESS TEMP(F) 341. PRODUCT TEXTILE-FINI HOURS PER YEAR 8240.

POWER TO HEAT RATIO 0.134

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	186.	66.	186.	COAL-FGD	252.	0	0.	0.08	0.63
1	STM141	STM-TURB-1	POWR	0.	41.	141.	98.	21.	6.	70.	0.	211.	RESIDUAL	211.	10	0.16	0.10	0.75
1	STM141	STM-TURB-1	HEAT	0.	66.	226.	158.	34.	10.	0.	-40.	226.	RESIDUAL	186.	0	0.23	0.15	0.70
1	STM141	STM-TURB-1	POWR	0.	41.	141.	98.	21.	6.	70.	0.	211.	COAL-FGD	211.	10	0.16	0.10	0.75
1	STM141	STM-TURB-1	HEAT	0.	66.	226.	158.	34.	10.	0.	-40.	226.	COAL-FGD	186.	0	0.23	0.15	0.70
1	STM141	STM-TURB-1	POWR	0.	41.	141.	98.	21.	6.	70.	0.	211.	COAL-AFB	211.	10	0.16	0.10	0.75
1	STM141	STM-TURB-1	HEAT	0.	66.	226.	158.	34.	10.	0.	-40.	226.	COAL-AFB	186.	0	0.23	0.15	0.70
2	STM088	STM-TURB-8	POWR	0.	41.	182.	134.	21.	6.	29.	0.	211.	RESIDUAL	211.	0	0.16	0.10	0.75
2	STM088	STM-TURB-8	HEAT	0.	49.	215.	158.	25.	7.	0.	-12.	215.	RESIDUAL	203.	0	0.18	0.12	0.73
2	STM088	STM-TURB-8	POWR	0.	41.	182.	134.	21.	6.	29.	0.	211.	COAL-FGD	211.	0	0.16	0.10	0.75
2	STM088	STM-TURB-8	HEAT	0.	49.	215.	158.	25.	7.	0.	-12.	215.	COAL-FGD	203.	0	0.18	0.12	0.73
2	STM088	STM-TURB-8	POWR	0.	41.	182.	134.	21.	6.	29.	0.	211.	COAL-AFB	211.	0	0.16	0.10	0.75
2	STM088	STM-TURB-8	HEAT	0.	49.	215.	158.	25.	7.	0.	-12.	215.	COAL-AFB	203.	0	0.18	0.12	0.73
3	PFBSTM	PFB-STMTB-	POWR	0.	40.	98.	61.	21.	6.	114.	0.	212.	COAL-PFB	212.	10	0.16	0.10	0.75
3	PFBSTM	PFB-STMTB-	HEAT	0.	104.	252.	158.	54.	16.	0.	-104.	252.	COAL-PFB	148.	0	0.29	0.22	0.63
4	TISTMT	TI-STMTB-1	POWR	0.	41.	80.	46.	21.	6.	132.	0.	211.	RESIDUAL	211.	10	0.16	0.10	0.75
4	TISTMT	TI-STMTB-1	HEAT	0.	139.	273.	158.	72.	21.	0.	-160.	273.	RESIDUAL	113.	0	0.34	0.26	0.58
4	TISTMT	TI-STMTB-1	POWR	0.	41.	80.	46.	21.	6.	132.	0.	211.	COAL	211.	10	0.16	0.10	0.75
4	TISTMT	TI-STMTB-1	HEAT	0.	139.	273.	158.	72.	21.	0.	-160.	273.	COAL	113.	0	0.34	0.26	0.58
5	TIHRSG	THERMIONIC	POWR	0.	31.	150.	98.	21.	6.	70.	0.	221.	RESIDUAL	221.	0	0.12	0.10	0.72
5	TIHRSG	THERMIONIC	HEAT	0.	50.	242.	158.	34.	10.	0.	-40.	242.	RESIDUAL	202.	0	0.17	0.14	0.66
5	TIHRSG	THERMIONIC	POWR	0.	31.	150.	98.	21.	6.	70.	0.	221.	COAL	221.	0	0.12	0.10	0.72
5	TIHRSG	THERMIONIC	HEAT	0.	50.	242.	158.	34.	10.	0.	-40.	242.	COAL	202.	0	0.17	0.14	0.66
6	STIRL	STIRLING-1	POWR	0.	30.	82.	39.	21.	6.	140.	0.	222.	DISTILLA	222.	0	0.12	0.10	0.71
6	STIRL	STIRLING-1	HEAT	0.	121.	335.	158.	86.	25.	0.	-204.	335.	DISTILLA	131.	0	0.26	0.26	0.47

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 22601 MW 6.20 PROCESS MILLIONS BTU/HR 158.0 PROCESS TEMP(F) 341. PRODUCT TEXTILE-FIMI HOURS PER YEAR 6240.

POWER TO HEAT RATIO 0.134

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	30.	82.	39.	21.	6.	140.	0.	222.	RESIDUAL	222.	0	0.12	0.10	0.71
6	STIRL	STIRLING-1	HEAT	0.	121.	335.	158.	86.	25.	0.	-204.	335.	RESIDUAL	131.	0	0.26	0.26	0.47
6	STIRL	STIRLING-1	POWR	0.	30.	82.	39.	21.	6.	140.	0.	222.	COAL	222.	0	0.12	0.10	0.71
6	STIRL	STIRLING-1	HEAT	0.	121.	335.	158.	86.	25.	0.	-204.	335.	COAL	131.	0	0.26	0.26	0.47
7	HEGT85	HELIUM-GT-	POWR	0.	12.	66.	10.	21.	6.	174.	0.	240.	COAL-AFB	240.	10	0.05	0.09	0.66
7	HEGT85	HELIUM-GT-	HEAT	0.	189.	1018.	158.	327.	96.	0.	-955.	1018.	COAL-AFB	63.	0	0.16	0.32	0.16
8	HEGT60	HELIUM-GT-	POWR	0.	15.	82.	26.	21.	6.	156.	0.	237.	COAL-AFB	237.	10	0.06	0.09	0.67
8	HEGT60	HELIUM-GT-	HEAT	0.	90.	504.	158.	131.	38.	0.	-342.	504.	COAL-AFB	162.	10	0.15	0.26	0.31
9	HEGT00	HELIUM-GT-	POWR	0.	16.	120.	59.	21.	6.	116.	0.	236.	COAL-AFB	236.	10	0.06	0.09	0.67
9	HEGT00	HELIUM-GT-	HEAT	0.	42.	320.	158.	56.	16.	0.	-110.	320.	COAL-AFB	210.	10	0.12	0.18	0.49
10	FCMCCL	FUEL-CL-MO	POWR	0.	35.	70.	33.	21.	6.	147.	0.	217.	COAL	217.	10	0.14	0.10	0.73
10	FCMCCL	FUEL-CL-MO	HEAT	0.	169.	333.	158.	101.	30.	0.	-251.	333.	COAL	83.	10	0.34	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	37.	55.	21.	21.	6.	161.	0.	215.	COAL	215.	10	0.15	0.10	0.73
11	FCSTCL	FUEL-CL-ST	HEAT	0.	271.	404.	158.	156.	46.	0.	-423.	404.	COAL	-19.	10	0.40	0.39	0.39
12	IGGTST	INT-GAS-GT	POWR	0.	29.	73.	31.	21.	6.	150.	0.	223.	COAL	223.	10	0.12	0.09	0.71
12	IGGTST	INT-GAS-GT	HEAT	0.	151.	376.	158.	109.	32.	0.	-275.	376.	COAL	101.	10	0.29	0.29	0.42
13	GTSOAR	GT-HRSG-10	POWR	0.	30.	73.	31.	21.	6.	149.	0.	222.	RESIDUAL	222.	10	0.12	0.10	0.71
13	GTSOAR	GT-HRSG-10	HEAT	0.	152.	366.	158.	106.	31.	0.	-266.	366.	RESIDUAL	100.	0	0.29	0.29	0.43
14	GTAC08	GT-HRSG-08	POWR	0.	35.	78.	40.	21.	6.	139.	0.	217.	RESIDUAL	217.	10	0.14	0.10	0.73
14	GTAC08	GT-HRSG-08	HEAT	0.	138.	308.	158.	83.	24.	0.	-193.	308.	RESIDUAL	114.	0	0.31	0.27	0.51
15	GTAC12	GT-HRSG-12	POWR	0.	35.	69.	32.	21.	6.	148.	0.	217.	RESIDUAL	217.	10	0.14	0.10	0.73
15	GTAC12	GT-HRSG-12	HEAT	0.	170.	340.	158.	104.	30.	0.	-257.	340.	RESIDUAL	82.	0	0.33	0.31	0.47
16	GTAC16	GT-HRSG-16	POWR	0.	34.	65.	29.	21.	6.	152.	0.	218.	RESIDUAL	218.	10	0.14	0.10	0.73
16	GTAC16	GT-HRSG-16	HEAT	0.	189.	363.	158.	117.	34.	0.	-300.	363.	RESIDUAL	63.	0	0.34	0.32	0.44
17	GTWC16	GT-HRSG-16	POWR	0.	31.	67.	27.	21.	6.	154.	0.	221.	RESIDUAL	221.	10	0.12	0.10	0.71
17	GTWC16	GT-HRSG-16	HEAT	0.	180.	391.	158.	123.	36.	0.	-318.	391.	RESIDUAL	72.	0	0.32	0.32	0.40

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 22601 MW 6.20 PROCESS MILLIONS BTU/HR 158.0 PROCESS TEMP(F) 341. PRODUCT TEXTILE-FINI HOURS PER YEAR 6240.

POWER TO HEAT RATIO 0.134

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	31.	55.	17.	21.	6.	166.	0.	221.	RESIDUAL	221.	10	0.12	0.10	0.71
18 CC1626 GTST-16/26 HEAT	0.	285.	516.	158.	197.	58.	0.	-548.	516.	RESIDUAL	-33.	0	0.36	0.38	0.31
19 CC1622 GTST-16/22 POWR	0.	32.	56.	19.	21.	6.	164.	0.	220.	RESIDUAL	220.	10	0.13	0.10	0.72
19 CC1622 GTST-16/22 HEAT	0.	269.	470.	158.	177.	52.	0.	-487.	470.	RESIDUAL	-17.	0	0.36	0.38	0.34
20 CC1222 GTST-12/22 POWR	0.	32.	56.	19.	21.	6.	164.	0.	220.	RESIDUAL	220.	10	0.13	0.10	0.72
20 CC1222 GTST-12/22 HEAT	0.	270.	466.	158.	176.	52.	0.	-484.	466.	RESIDUAL	-18.	0	0.37	0.38	0.34
21 CC0822 GTST-08/22 POWR	0.	35.	59.	24.	21.	6.	158.	0.	217.	RESIDUAL	217.	10	0.14	0.10	0.73
21 CC0822 GTST-08/22 HEAT	0.	230.	394.	158.	140.	41.	0.	-373.	394.	RESIDUAL	22.	0	0.37	0.38	0.40
22 STIG15 STIG-15-16 POWR	0.	11.	56.	1.	21.	6.	185.	0.	241.	RESIDUAL	241.	10	0.05	0.09	0.66
22 STIG15 STIG-15-16 HEAT	0.	2503.	12154.	158.	4631.	1357.	0.	-14405.	12154.	RESIDUAL	-2251.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	16.	59.	8.	21.	6.	177.	0.	236.	RESIDUAL	236.	10	0.07	0.09	0.67
23 STIG10 STIG-10-16 HEAT	0.	332.	1192.	158.	428.	126.	0.	-1272.	1192.	RESIDUAL	-80.	0	0.22	0.38	0.13
24 STIG1S STIG-1S-16 POWR	0.	19.	63.	13.	21.	6.	170.	0.	233.	RESIDUAL	233.	10	0.07	0.09	0.68
24 STIG1S STIG-1S-16 HEAT	0.	221.	750.	158.	251.	74.	0.	-719.	750.	RESIDUAL	31.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	24.	57.	12.	21.	6.	171.	0.	228.	RESIDUAL	228.	0	0.09	0.09	0.69
25 DEADV3 DIESEL-ADV HEAT	0.	303.	733.	158.	272.	80.	0.	-784.	733.	RESIDUAL	-51.	0	0.29	0.37	0.22
26 DEADV2 DIESEL-ADV POWR	0.	26.	57.	14.	21.	6.	169.	0.	226.	RESIDUAL	226.	1	0.10	0.09	0.70
26 DEADV2 DIESEL-ADV HEAT	0.	285.	622.	158.	231.	68.	0.	-655.	622.	RESIDUAL	-33.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	35.	57.	22.	21.	6.	160.	0.	217.	RESIDUAL	217.	1	0.14	0.10	0.73
27 DEADV1 DIESEL-ADV HEAT	0.	250.	404.	158.	150.	44.	0.	-402.	404.	RESIDUAL	2.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	35.	63.	27.	21.	6.	154.	0.	217.	RESIDUAL	217.	0	0.14	0.10	0.73
28 DEHTPM ADV-DIESEL HEAT	0.	205.	368.	158.	124.	36.	0.	-320.	368.	RESIDUAL	47.	0	0.36	0.34	0.43
29 DESOA3 DIESEL-SOA POWR	0.	20.	59.	11.	21.	6.	173.	0.	232.	DISTILLA	232.	0	0.08	0.09	0.68
29 DESOA3 DIESEL-SOA HEAT	0.	297.	870.	158.	314.	92.	0.	-916.	870.	DISTILLA	-45.	0	0.25	0.38	0.18
29 DESOA3 DIESEL-SOA POWR	0.	20.	59.	11.	21.	6.	173.	0.	232.	RESIDUAL	232.	0	0.08	0.09	0.68
29 DESOA3 DIESEL-SOA HEAT	0.	297.	870.	158.	314.	92.	0.	-916.	870.	RESIDUAL	-45.	0	0.25	0.38	0.18

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 22601 MW 6.20 PROCESS MILLIONS BTU/HR 158.0 PROCESS TEMP(F) 341. PRODUCT TEXTILE-FINI HOURS PER YEAR 6240.

POWER TO HEAT RATIO 0.134

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	23.	59.	13.	21.	6.	171.	0.	229.	DISTILLA	229.	1	0.09	0.09	0.69
30 DESOA2 DIESEL-SOA HEAT	0.	278.	718.	158.	259.	76.	0.	-744.	718.	DISTILLA	-26	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	23.	59.	13.	21.	6.	171.	0.	229.	RESIDUAL	229.	1	0.09	0.09	0.69
30 DESOA2 DIESEL-SOA HEAT	0.	278.	718.	158.	259.	76.	0.	-744.	718.	RESIDUAL	-25.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	35.	59.	23.	21.	6.	158.	0.	217.	DISTILLA	217.	1	0.14	0.10	0.73
31 DESOA1 DIESEL-SOA HEAT	0.	236.	394.	158.	142.	42.	0.	-378.	394.	DISTILLA	16.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	35.	59.	23.	21.	6.	158.	0.	217.	RESIDUAL	217.	1	0.14	0.10	0.73
31 DESOA1 DIESEL-SOA HEAT	0.	236.	394.	158.	142.	42.	0.	-378.	394.	RESIDUAL	16.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	33.	72.	34.	21.	6.	146.	0.	219.	DISTILLA	219.	10	0.13	0.10	0.72
32 GTSOAD GT-HRSG-10 HEAT	0.	156.	341.	158.	100.	29.	0.	-245.	341.	DISTILLA	96.	0	0.31	0.29	0.46
33 GTRA08 GT-85RE-08 POWR	0.	31.	59.	21.	21.	6.	162.	0.	221.	DISTILLA	221.	10	0.12	0.10	0.71
33 GTRA08 GT-85RE-08 HEAT	0.	239.	456.	158.	163.	48.	0.	-443.	456.	DISTILLA	13.	0	0.34	0.36	0.35
34 GTRA12 GT-85RE-12 POWR	0.	32.	59.	21.	21.	6.	161.	0.	220.	DISTILLA	220.	10	0.13	0.10	0.72
34 GTRA12 GT-85RE-12 HEAT	0.	239.	445.	158.	159.	47.	0.	-432.	445.	DISTILLA	13.	0	0.35	0.36	0.35
35 GTRA16 GT-85RE-16 POWR	0.	32.	61.	22.	21.	6.	160.	0.	220.	DISTILLA	220.	10	0.13	0.10	0.72
35 GTRA16 GT-85RE-16 HEAT	0.	225.	427.	158.	149.	44.	0.	-400.	427.	DISTILLA	27.	0	0.34	0.35	0.37
36 GTR208 GT-60RE-08 POWR	0.	32.	66.	27.	21.	6.	154.	0.	220.	DISTILLA	220.	10	0.13	0.10	0.72
36 GTR208 GT-60RE-08 HEAT	0.	186.	387.	158.	124.	36.	0.	-321.	387.	DISTILLA	66.	0	0.32	0.32	0.41
37 GTR212 GT-60RE-12 POWR	0.	32.	64.	25.	21.	6.	156.	0.	220.	DISTILLA	220.	10	0.13	0.10	0.72
37 GTR212 GT-60RE-12 HEAT	0.	198.	403.	158.	133.	39.	0.	-349.	403.	DISTILLA	54.	0	0.33	0.33	0.39
38 GTR216 GT-60RE-16 POWR	0.	32.	63.	25.	21.	6.	157.	0.	220.	DISTILLA	220.	10	0.13	0.10	0.72
38 GTR216 GT-60RE-16 HEAT	0.	207.	404.	158.	136.	40.	0.	-359.	404.	DISTILLA	45.	0	0.34	0.34	0.39
39 GTRW08 GT-85RE-08 POWR	0.	26.	60.	17.	21.	6.	166.	0.	226.	DISTILLA	226.	10	0.10	0.09	0.70
39 GTRW08 GT-85RE-08 HEAT	0.	240.	555.	158.	195.	57.	0.	-542.	555.	DISTILLA	12.	0	0.30	0.35	0.28
40 GTRW12 GT-85RE-12 POWR	0.	28.	58.	17.	21.	6.	166.	0.	224.	DISTILLA	224.	10	0.11	0.09	0.70
40 GTRW12 GT-85RE-12 HEAT	0.	261.	545.	158.	198.	58.	0.	-554.	545.	DISTILLA	-9.	0	0.32	0.36	0.29

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 22601 MW 6.20 PROCESS MILLIONS BTU/HR 158.0 PROCESS TEMP(F) 341. PRODUCT TEXTILE-FINI HOURS PER YEAR 8240.

POWER TO HEAT RATIO 0.134

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	28.	59.	18.	21.	6.	165.	0.	224.	DISTILLA	224.	10	0.11	0.09	0.71
41 GTRW16 GT-85RE-16 HEAT	0.	246.	517.	158.	184.	54.	0.	-510.	517.	DISTILLA	6.	0	0.32	0.36	0.31
42 GTR308 GT-60RE-08 POWR	0.	24.	68.	22.	21.	6.	159.	0.	228.	DISTILLA	228.	10	0.10	0.09	0.69
42 GTR308 GT-60RE-08 HEAT	0.	171.	480.	158.	149.	44.	0.	-399.	480.	DISTILLA	81.	0	0.26	0.31	0.33
43 GTR312 GT-60RE-12 POWR	0.	29.	62.	21.	21.	6.	162.	0.	223.	DISTILLA	223.	10	0.11	0.09	0.71
43 GTR312 GT-60RE-12 HEAT	0.	218.	472.	158.	161.	47.	0.	-438.	472.	DISTILLA	34.	0	0.32	0.34	0.33
44 GTR316 GT-60RE-16 POWR	0.	28.	62.	21.	21.	6.	161.	0.	224.	DISTILLA	224.	10	0.11	0.09	0.71
44 GTR316 GT-60RE-16 HEAT	0.	214.	469.	158.	159.	47.	0.	-431.	469.	DISTILLA	38.	0	0.31	0.34	0.34
45 FCPADS FUEL-CL-PH POWR	0.	22.	56.	9.	21.	6.	175.	0.	230.	DISTILLA	230.	0	0.09	0.09	0.69
45 FCPADS FUEL-CL-PH HEAT	0.	360.	929.	158.	353.	104.	0.	-1038.	929.	DISTILLA	-108.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	29.	51.	12.	21.	6.	172.	0.	223.	DISTILLA	223.	0	0.11	0.09	0.71
46 FCMCDS FUEL-CL-MO HEAT	0.	381.	678.	158.	279.	82.	0.	-807.	678.	DISTILLA	-129.	0	0.36	0.41	0.23

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24211 MW 1.50 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 353. PRODUCT SOFTWOOD-LUM HOURS PER YEAR 4000.

POWER TO HEAT RATIO 0.171

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	0	0.	0.10	0.58
1	STM141	STM-TURB-1	POWR	41.	10.	37.	26.	5.	2.	4.	0.	41.	RESIDUAL	41.	10	0.99	0.12	0.73
1	STM141	STM-TURB-1	HEAT	41.	11.	42.	30.	6.	2.	0.	-2.	42.	RESIDUAL	40.	10	0.95	0.14	0.71
1	STM141	STM-TURB-1	POWR	41.	10.	37.	26.	5.	2.	4.	0.	41.	COAL-FGD	41.	10	0.99	0.12	0.73
1	STM141	STM-TURB-1	HEAT	41.	11.	42.	30.	6.	2.	0.	-2.	42.	COAL-FGD	40.	10	0.95	0.14	0.71
1	STM141	STM-TURB-1	POWR	41.	10.	37.	26.	5.	2.	4.	0.	41.	COAL-AFB	41.	10	0.99	0.12	0.73
1	STM141	STM-TURB-1	HEAT	41.	11.	42.	30.	6.	2.	0.	-2.	42.	COAL-AFB	40.	10	0.95	0.14	0.71
2	STM088	STM-TURB-8	POWR	41.	2.	50.	37.	5.	2.	-8.	0.	50.	RESIDUAL	50.	10	0.47	0.10	0.60
2	STM088	STM-TURB-8	HEAT	40.	8.	40.	30.	4.	1.	0.	3.	40.	RESIDUAL	43.	10	0.81	0.10	0.69
2	STM088	STM-TURB-8	POWR	41.	2.	50.	37.	5.	2.	-8.	0.	50.	COAL-FGD	50.	10	0.47	0.10	0.60
2	STM088	STM-TURB-8	HEAT	40.	8.	40.	30.	4.	1.	0.	3.	40.	COAL-FGD	43.	10	0.81	0.10	0.69
2	STM088	STM-TURB-8	POWR	41.	2.	50.	37.	5.	2.	-8.	0.	50.	COAL-AFB	50.	10	0.47	0.10	0.60
2	STM088	STM-TURB-8	HEAT	40.	8.	40.	30.	4.	1.	0.	3.	40.	COAL-AFB	43.	10	0.81	0.10	0.69
3	PFBSTM	PFB-STMTB-	POWR	41.	10.	25.	16.	5.	2.	17.	0.	42.	COAL-PFB	42.	10	0.98	0.12	0.72
3	PFBSTM	PFB-STMTB-	HEAT	41.	18.	47.	30.	10.	3.	0.	-14.	47.	COAL-PFB	33.	10	0.80	0.20	0.64
4	TISTMT	TI-STMTB-1	POWR	21.	10.	20.	12.	5.	2.	21.	0.	41.	RESIDUAL	41.	10	-0.26	0.12	0.72
4	TISTMT	TI-STMTB-1	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
4	TISTMT	TI-STMTB-1	POWR	41.	10.	20.	12.	5.	2.	21.	0.	41.	COAL	41.	10	0.98	0.12	0.72
4	TISTMT	TI-STMTB-1	HEAT	41.	25.	51.	30.	13.	4.	0.	-25.	51.	COAL	26.	10	0.76	0.26	0.59
5	TIHRSG	THERMIONIC	POWR	7.	7.	36.	24.	5.	2.	7.	0.	44.	RESIDUAL	44.	10	-1.27	0.12	0.68
5	TIHRSG	THERMIONIC	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
5	TIHRSG	THERMIONIC	POWR	41.	7.	36.	24.	5.	2.	7.	0.	44.	COAL	44.	10	0.83	0.12	0.68
5	TIHRSG	THERMIONIC	HEAT	41.	9.	46.	30.	6.	2.	0.	-4.	46.	COAL	42.	10	0.75	0.14	0.65
6	STIRL	STIRLING-1	POWR	24.	7.	20.	10.	5.	2.	24.	0.	44.	DISTILLA	44.	0	-0.25	0.12	0.68
6	STIRL	STIRLING-1	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24211 MW 1.50 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 353. PRODUCT SOFTWOOD-LUM HOURS PER YEAR 4000.

POWER TO HEAT RATIO 0.171

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	24.	7.	20.	10.	5.	2.	24.	0.	44.	RESIDUAL	44.	0	-0.25	0.12	0.68
6 STIRL STIRLING-1 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
6 STIRL STIRLING-1 POWR	41.	7.	20.	10.	5.	2.	24.	0.	44.	COAL	44.	0	0.81	0.12	0.68
6 STIRL STIRLING-1 HEAT	41.	22.	63.	30.	16.	5.	0.	-34.	63.	COAL	29.	0	0.56	0.26	0.47
7 HEGT85 HELIUM-GT- POWR	41.	3.	16.	2.	5.	2.	33.	0.	49.	COAL-AFB	49.	10	0.53	0.11	0.62
7 HEGT85 HELIUM-GT- HEAT	41.	36.	218.	30.	70.	20.	0.	-203.	218.	COAL-AFB	15.	10	0.19	0.32	0.14
8 HEGT60 HELIUM-GT- POWR	41.	3.	20.	6.	5.	2	28.	0.	48.	COAL-AFB	48.	10	0.57	0.11	0.62
8 HEGT60 HELIUM-GT- HEAT	41.	16.	99.	30.	26.	8.	0.	-64.	99.	COAL-AFB	35.	10	0.28	0.26	0.30
9 HEGT00 HELIUM-GT- POWR	41.	4.	29.	14.	5.	2.	18.	0.	48.	COAL-AFB	48.	10	0.60	0.11	0.63
9 HEGT00 HELIUM-GT- HEAT	41.	8.	61.	30.	11.	3.	0.	-18.	61.	COAL-AFB	43.	10	0.41	0.18	0.49
10 FCMCCL FUEL-CL-MO POWR	0.	9.	17.	8.	5.	2.	26.	0.	43.	COAL	43.	10	-1.67	0.12	0.70
10 FCMCCL FUEL-CL-MO HEAT	0.	32.	63.	30.	19.	6.	0.	-44.	63.	COAL	19.	10	-0.05	0.30	0.47
11 FCSTCL FUEL-CL-ST POWR	0.	9.	13.	5.	5.	2.	29.	0.	42.	COAL	42.	10	-1.65	0.12	0.71
11 FCSTCL FUEL-CL-ST HEAT	0.	50.	75.	30.	29.	8.	0.	-74.	75.	COAL	2.	10	0.16	0.38	0.40
12 IGGTST INT-GAS-GT POWR	0.	7.	18.	8.	5.	2.	26.	0.	44.	COAL	44.	10	-1.77	0.12	0.68
12 IGGTST INT-GAS-GT HEAT	0.	27.	70.	30.	20.	6.	0.	-46.	70.	COAL	24.	10	-0.13	0.28	0.43
13 GTSOAR GT-HRSG-10 POWR	26.	7.	18.	8.	5.	2.	26.	0.	44.	RESIDUAL	44.	10	-0.10	0.12	0.68
13 GTSOAR GT-HRSG-10 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
14 GTAC08 GT-HRSG-08 POWR	24.	9.	19.	10.	5.	2.	24.	0.	43.	RESIDUAL	43.	10	-0.19	0.12	0.70
14 GTAC08 GT-HRSG-08 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
15 GTAC12 GT-HRSG-12 POWR	26.	8.	17.	8.	5.	2.	26.	0.	43.	RESIDUAL	43.	10	-0.06	0.12	0.70
15 GTAC12 GT-HRSG-12 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
16 GTAC16 GT-HRSG-16 POWR	27.	8.	16.	7.	5.	2.	27.	0.	43.	RESIDUAL	43.	10	0.01	0.12	0.70
16 GTAC16 GT-HRSG-16 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
17 GTWC16 GT-HRSG-16 POWR	28.	7.	16.	7.	5.	2.	28.	0.	44.	RESIDUAL	44.	10	-0.02	0.12	0.68
17 GTWC16 GT-HRSG-16 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24211 MW 1.50 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 353. PRODUCT SOFTWOOD-LUM HOURS PER YEAR 4000.

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UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	30.	7.	14.	4.	5.	2.	30.	0.	44.	RESIDUAL	44.	10	0.15	0.12	0.68
18 CC1626 GTST-16/26 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
19 CC1622 GTST-16/22 POWR	30.	8.	14.	5.	5.	2.	30.	0.	44.	RESIDUAL	44.	10	0.14	0.12	0.69
19 CC1622 GTST-16/22 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
20 CC1222 GTST-12/22 POWR	30.	8.	14.	5.	5.	2.	30.	0.	43.	RESIDUAL	43.	10	0.14	0.12	0.69
20 CC1222 GTST-12/22 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
21 CC0822 GTST-08/22 POWR	28.	8.	15.	6.	5.	2.	28.	0.	43.	RESIDUAL	43.	10	0.08	0.12	0.70
21 CC0822 GTST-08/22 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
22 STIG15 STIG-15-16 POWR	35.	3.	13.	0.	5.	2.	35.	0.	49.	RESIDUAL	49.	10	0.16	0.11	0.62
22 STIG15 STIG-15-16 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
23 STIG10 STIG-10-16 POWR	33.	4.	14.	2.	5.	2.	33.	0.	47.	RESIDUAL	47.	10	0.11	0.11	0.63
23 STIG10 STIG-10-16 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
24 STIG1S STIG-1S-16 POWR	32.	5.	15.	3.	5.	2.	32.	0.	47.	RESIDUAL	47.	10	0.06	0.11	0.64
24 STIG1S STIG-1S-16 HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
25 DEADV3 DIESEL-ADV POWR	32.	6.	14.	3.	5.	2.	32.	0.	46.	RESIDUAL	46.	10	0.14	0.11	0.66
25 DEADV3 DIESEL-ADV HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
26 DEADV2 DIESEL-ADV POWR	31.	6.	14.	4.	5.	2.	31.	0.	45.	RESIDUAL	45.	11	0.14	0.11	0.67
26 DEADV2 DIESEL-ADV HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	111	0.00	0.	0.58
27 DEADV1 DIESEL-ADV POWR	29.	9	14.	5.	5.	2.	29.	0.	43.	RESIDUAL	43.	11	0.14	0.12	0.70
27 DEADV1 DIESEL-ADV HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	111	0.00	0.	0.58
28 DEHTPM ADV-DIESEL POWR	28.	8.	15.	7.	5.	2.	28.	0.	43.	RESIDUAL	43.	10	0.04	0.12	0.70
28 DEHTPM ADV-DIESEL HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58
29 DESOA3 DIESEL-SOA POWR	32.	5.	14.	3.	5.	2.	32.	0.	47.	DISTILLA	47.	0	0.11	0.11	0.64
29 DESOA3 DIESEL-SOA HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
29 DESOA3 DIESEL-SOA POWR	32.	5.	14.	3.	5.	2.	32.	0.	47.	RESIDUAL	47.	0	0.11	0.11	0.64
29 DESOA3 DIESEL-SOA HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	110	0.00	0.	0.58

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

ORIGINAL PAGE IS OF POOR QUALITY

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24211 MW 1.50 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 353. PRODUCT SOFTWOOD-LUM HOURS PER YEAR 4000.

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30	DESOA2	DIESEL-SOA	POWR	32.	5.	14.	3.	5.	2.	32.	0.	46.	DISTILLA	46.	1	0.11	0.11	0.65
30	DESOA2	DIESEL-SOA	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	111	0.00	0.	0.58
30	DESOA2	DIESEL-SOA	POWR	32.	5.	14.	3.	5.	2.	32.	0.	46.	RESIDUAL	46.	1	0.11	0.11	0.65
30	DESOA2	DIESEL-SOA	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	111	0.00	0.	0.58
31	DESOA1	DIESEL-SOA	POWR	29.	9.	14.	6.	5.	2.	29.	0.	43.	DISTILLA	43.	1	0.11	0.12	0.70
31	DESOA1	DIESEL-SOA	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	111	0.00	0.	0.58
31	DESOA1	DIESEL-SOA	POWR	29.	9.	14.	6.	5.	2.	29.	0.	43.	RESIDUAL	43.	1	0.11	0.12	0.70
31	DESOA1	DIESEL-SOA	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	RESIDUAL	51.	111	0.00	0.	0.58
32	GTSOAD	GT-HRSG-10	POWR	26.	8.	18.	8.	5.	2.	26.	0.	43.	DISTILLA	43.	10	-0.10	0.12	0.69
32	GTSOAD	GT-HRSG-10	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
33	GTRA08	GT-85RE-08	POWR	30.	7.	14.	5.	5.	2.	30.	0.	44.	DISTILLA	44.	10	0.10	0.12	0.68
33	GTRA08	GT-85RE-08	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
34	GTRA12	GT-85RE-12	POWR	29.	8.	14.	5.	5.	2.	29.	0.	44.	DISTILLA	44.	10	0.11	0.12	0.69
34	GTRA12	GT-85RE-12	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
35	GTRA16	GT-85RE-16	POWR	29.	8.	15.	5.	5.	2.	29.	0.	44.	DISTILLA	44.	10	0.08	0.12	0.69
35	GTRA16	GT-85RE-16	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
36	GTR208	GT-60RE-08	POWR	28.	8.	16.	6.	5.	2.	28.	0.	44.	DISTILLA	44.	10	0.00	0.12	0.69
36	GTR208	GT-60RE-08	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
37	GTR212	GT-60RE-12	POWR	28.	8.	16.	6.	5.	2.	28.	0.	44.	DISTILLA	44.	10	0.03	0.12	0.69
37	GTR212	GT-60RE-12	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
38	GTR216	GT-60RE-16	POWR	28.	8.	15.	6.	5.	2.	28.	0.	44.	DISTILLA	44.	10	0.05	0.12	0.69
38	GTR216	GT-60RE-16	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
39	GTRW08	GT-85RE-08	POWR	30.	6.	15.	4.	5.	2.	30.	0.	45.	DISTILLA	45.	10	0.09	0.11	0.67
39	GTRW08	GT-85RE-08	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
40	GTRW12	GT-85RE-12	POWR	31.	7.	14.	4.	5.	2.	31.	0.	45.	DISTILLA	45.	10	0.12	0.11	0.67
40	GTRW12	GT-85RE-12	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58

FUEL ENERGY SAVED BY PROCESS AND ECS

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				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	GTRW16	GT-85RE-16	POWR	[illegible]	7.	14.	4.	5.	2.	30.	0.	45.	DISTILLA	45.	10	0.10	0.11	0.67
41	GTRW16	GT-85RE-16	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
42	GTR308	GT-60RE-08	POWR	29.	6.	17.	5.	5.	2.	29.	0.	45.	DISTILLA	45.	10	-0.03	0.11	0.66
42	GTR308	GT-60RE-08	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
43	GTR312	GT-60RE-12	POWR	29.	7.	15.	5.	5.	2.	29.	0.	44.	DISTILLA	44.	10	0.06	0.12	0.68
43	GTR312	GT-60RE-12	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
44	GTR316	GT-60RE-16	POWR	29.	7.	15.	5.	5.	2.	29.	0.	44.	DISTILLA	44.	10	0.06	0.12	0.68
44	GTR316	GT-60RE-16	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
45	FCPADS	FUEL-CL-PH	POWR	33.	5.	13.	2.	5.	2.	33.	0.	46.	DISTILLA	46.	0	0.16	0.11	0.66
45	FCPADS	FUEL-CL-PH	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58
46	FCMCDS	FUEL-CL-MO	POWR	32.	7.	12.	3.	5.	2.	32.	0.	44.	DISTILLA	44.	10	0.22	0.12	0.68
46	FCMCDS	FUEL-CL-MO	HEAT	35.	0.	0.	0.	0.	0.	35.	16.	35.	DISTILLA	51.	110	0.00	0.	0.58

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24361 MW 3.00 PROCESS MILLIONS BTU/HR 75.0 PROCESS TEMP(F) 406. PRODUCT SOFT-PLYWOOD HOURS PER YEAR 6000.

POWER TO HEAT RATIO 0.136

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 100. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	88.	0.	0.	0.	0.	0.	88.	32.	88.	COAL-AFB	120.	0	0.	0.09	0.62
1 STM141 STM-TURB-1 POWR	100.	20.	95.	71.	10.	3.	5.	0.	100.	RESIDUAL	100.	10	0.99	0.10	0.75
1 STM141 STM-TURB-1 HEAT	100.	21.	101.	75.	11.	3.	0.	-2.	101.	RESIDUAL	99.	10	0.97	0.11	0.74
1 STM141 STM-TURB-1 POWR	100.	20.	95.	71.	10.	3.	5.	0.	100.	COAL-FGD	100.	10	0.99	0.10	0.75
1 STM141 STM-TURB-1 HEAT	100.	21.	101.	75.	11.	3.	0.	-2.	101.	COAL-FGD	99.	10	0.97	0.11	0.74
1 STM141 STM-TURB-1 POWR	100.	20.	95.	71.	10.	3.	5.	0.	100.	COAL-AFB	100.	10	0.99	0.10	0.75
1 STM141 STM-TURB-1 HEAT	100.	21.	101.	75.	11.	3.	0.	-2.	101.	COAL-AFB	99.	10	0.97	0.11	0.74
2 STM088 STM-TURB-8 POWR	100.	-22.	142.	111.	10.	3.	-42.	0.	142.	RESIDUAL	142.	10	-0.33	0.07	0.53
2 STM088 STM-TURB-8 HEAT	96.	13.	96.	75.	7.	2.	0.	10.	96.	RESIDUAL	107.	10	0.68	0.06	0.70
2 STM088 STM-TURB-8 POWR	100.	-22.	142.	111.	10.	3.	-42.	0.	142.	COAL-FGD	142.	10	-0.33	0.07	0.53
2 STM088 STM-TURB-8 HEAT	96.	13.	96.	75.	7.	2.	0.	10.	96.	COAL-FGD	107.	10	0.68	0.06	0.70
2 STM088 STM-TURB-8 POWR	100.	-22.	142.	111.	10.	3.	-42.	0.	142.	COAL-AFB	142.	10	-0.33	0.07	0.53
2 STM088 STM-TURB-8 HEAT	96.	13.	96.	75.	7.	2.	0.	10.	96.	COAL-AFB	107.	10	0.68	0.06	0.70
3 PFBSTM PFB-STMTB- POWR	100.	19.	57.	38.	10.	3.	44.	0.	101.	COAL-PFB	101.	10	0.97	0.10	0.74
3 PFBSTM PFB-STMTB- HEAT	100.	38.	113.	75.	20.	6.	0.	-31.	113.	COAL-PFB	82.	10	0.79	0.18	0.66
4 TISTMT TI-STMTB-1 POWR	56.	20.	45.	27.	10.	3.	56.	0.	101.	RESIDUAL	101.	10	-0.40	0.10	0.75
4 TISTMT TI-STMTB-1 HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	RESIDUAL	120.	110	-0.00	0.	0.62
4 TISTMT TI-STMTB-1 POWR	100.	20.	45.	27.	10.	3.	56.	0.	101.	COAL	101.	10	0.98	0.10	0.75
4 TISTMT TI-STMTB-1 HEAT	100.	53.	122.	75.	28.	8.	0.	-55.	122.	COAL	67.	10	0.75	0.23	0.61
5 TIHRSG THERMIONIC POWR	34.	13.	73.	46.	10.	3.	34.	0.	107.	RESIDUAL	107.	0	-1.27	0.10	0.70
5 TIHRSG THERMIONIC HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	RESIDUAL	120.	110	-0.00	0.	0.62
5 TIHRSG THERMIONIC POWR	100.	13.	73.	46.	10.	3.	34.	0.	107.	COAL	107.	0	0.78	0.10	0.70
5 TIHRSG THERMIONIC HEAT	100.	22.	119.	75.	17.	5.	0.	-20.	119.	COAL	99.	0	0.64	0.14	0.63
6 STIRL STIRLING-1 POWR	64.	14.	42.	21.	10.	3.	64.	0.	106.	DISTILLA	106.	0	-0.32	0.10	0.71
6 STIRL STIRLING-1 HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	DISTILLA	120.	110	-0.00	0.	0.62

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24361 MW 3.00 PROCESS MILLIONS BTU/HR 75.0 PROCESS TEMP(F) 406. PRODUCT SOFT-PLYWOOD HOURS PER YEAR 6000

POWER TO HEAT RATIO 0.136

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 100 HOT WATER BTU*10**6= 0

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	64.	14.	42.	21.	10	3.	64.	0.	106	RESIDUAL	106.	0	-0 32	0 10	0 71
6	STIRL	STIRLING-1	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0 00	0	0 62
6	STIRL	STIRLING-1	POWR	100.	14.	42.	21.	10	3	64	0.	106	COAL	106.	0	0 80	0 10	0 71
6	STIRL	STIRLING-1	HEAT	100.	51	154.	75.	37.	11.	0.	-65.	154	COAL	70.	0	0 54	0 24	0 43
7	HEGT85	HELIUM-GT-	POWR	100.	2.	32	2.	10	3	86	0.	118	COAL-AFB	118.	11	0 43	0 09	0 64
7	HEGT85	HELIUM-GT-	HEAT	100.	93.	1373.	75.	441	129.	0.	-1345.	1373	COAL-AFB	28	1	0 08	0 32	0 05
8	HEGT60	HELIUM-GT-	POWR	100.	4.	40.	10.	10.	3.	77.	0.	116.	COAL-AFB	116.	10	0 50	0 09	0 65
8	HEGT60	HELIUM-GT-	HEAT	100	31	300	75.	78.	23.	0.	-211.	300	COAL-AFB	89.	10	0 15	0 26	0 25
9	HEGT00	HELIUM-GT-	POWR	100.	7.	58.	28.	10.	3.	55.	0.	114	COAL-AFB	114.	10	0 56	0 09	0 66
9	HEGT00	HELIUM-GT-	HEAT	100.	18.	156	75.	28.	8.	0.	-54	156	COAL-AFB	102.	10	0 34	0 16	0 48
10	FCMCCL	FUEL-CL-MO	POWR	0.	17	34	16.	10.	3.	70	0	103	COAL	103.	10	-2 23	0 10	0 73
10	FCMCCL	FUEL-CL-MO	HEAT	0.	80.	159	75.	48.	14.	0	-119.	159	COAL	40.	10	-0 05	0 30	0 47
11	FCSTCL	FUEL-CL-ST	POWR	0	18	28	12	10	3.	74	0.	103	COAL	103.	10	-2 21	0 10	0 73
11	FCSTCL	FUEL-CL-ST	HEAT	0	113	181	75.	66.	19.	0.	-173.	181	COAL	7.	10	0 12	0 35	0 42
12	IGGTST	INT-GAS-GT	POWR	0.	14	39.	17.	10.	3.	68.	0.	107	COAL	107.	10	-2 33	0 10	0 70
12	IGGTST	INT-GAS-GT	HEAT	0	59	168	75	44	13.	0	-107.	168	COAL	81.	10	-0 21	0 [illegible]	0 45
13	GTSOAR	GT-HPSG-10	POWR	71.	14.	35	15.	10	3.	71.	0.	106	RESIDUAL	106	10	-0 10	0 10	0.70
13	GTSOAR	GT-HPSG-10	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0 00	0	0 62
14	GTAC08	GT-HPSG-08	POWR	65.	17.	38.	20.	10.	3.	65.	0.	103	RESIDUAL	103.	10	-0 19	0 10	0 73
14	GTAC08	GT-HPSG-08	HEAT	88	0.	0	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0 00	0	0 62
15	GTAC12	GT-HPSG-12	POWR	70.	17.	34.	16	10.	3.	70	0.	104	RESIDUAL	104.	10	-0 05	0 10	0 72
15	GTAC12	GT-HPSG-12	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0 00	0	0 62
16	GTAC16	GT-HPSG-16	POWR	72.	16.	32.	14.	10.	3.	72.	0.	104	RESIDUAL	104.	10	0 01	0 10	0 72
16	GTAC16	GT-HRSG-16	HEAT	88.	0	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0 00	0	0 62
17	GTWC16	GT-HRSG-16	POWR	73.	15.	32.	13.	10.	3.	73.	0.	105	RESIDUAL	105.	10	-0 02	0 10	0 71
17	GTWC16	GT-HRSG-16	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0 00	0	0 62

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO AD- DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24351 MW 3.00 PROCESS MILLIONS BTU/HR 75.0 PROCESS TEMP(F) 406. PRODUCT SOFT-PLYWOOD HOURS PER YEAR 8000

POWER TO HEAT RATIO 0.136

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 100 HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	[illegible]	[illegible] FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	77.	15.	28.	9	10.	3.	77.	0.	106	RESIDUAL	106.	10	0.12	0.10	0.71
18	CC1626	GTST-16/26	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0	0.62
19	CC1622	GTST-16/22	POWR	76.	15.	29.	10.	10.	3.	76.	0.	105	RESIDUAL	105.	10	0.10	0.10	0.71
19	CC1622	GTST-16/22	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0	0.62
20	CC1222	GTST-12/22	POWR	76.	15.	29.	10.	10.	3.	76.	0.	105	RESIDUAL	105.	10	0.10	0.10	0.72
20	CC1222	GTST-12/22	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0.	0.62
21	CC0822	GTST-08/22	POWR	73.	17.	31.	13.	10.	3.	73.	0.	104	RESIDUAL	104.	10	0.03	0.10	0.72
21	CC0822	GTST-08/22	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0.	0.62
22	STIG15	STIG-15-16	POWR	88.	6.	27.	0.	10.	3.	88.	0.	115	RESIDUAL	115.	10	0.15	0.03	0.65
22	STIG15	STIG-15-16	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0.	0.62
23	STIG10	STIG-10-16	POWR	84.	8.	29.	4.	10.	3.	84.	0.	112	RESIDUAL	112.	10	0.11	0.09	0.67
23	STIG10	STIG-10-16	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0.	0.62
24	STIG15	STIG-15-16	POWR	81.	9.	31.	6.	10.	3.	81.	0.	111	RESIDUAL	111.	10	0.05	0.09	0.67
24	STIG15	STIG-15-16	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0	0.62
25	DEADV3	DIESEL-ADV	POWR	82.	11.	28.	5.	10.	3.	82.	0.	110	RESIDUAL	110.	0	0.14	0.09	0.68
25	DEADV3	DIESEL-ADV	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0.	0.62
26	DEADV2	DIESEL-ADV	POWR	80.	13.	28.	7.	10.	3.	80.	0.	108	RESIDUAL	108.	1	0.14	0.10	0.70
26	DEADV2	DIESEL-ADV	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	111	-0.00	0.	0.62
27	DEADV1	DIESEL-ADV	POWR	76.	17.	28.	11.	10.	3.	76.	0.	103	RESIDUAL	103.	1	0.14	0.10	0.73
27	DEADV1	DIESEL-ADV	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	111	-0.00	0.	0.62
28	DEHTPM	ADV-DIESEL	POWR	72.	16.	33.	14.	10.	3.	72.	0.	105	RESIDUAL	105.	0	-0.05	0.10	0.72
28	DEHTPM	ADV-DIESEL	HEAT	88.	0	0.	0.	0.	0.	88.	32.	88	RESIDUAL	120.	110	-0.00	0.	0.62
29	DESOA3	DIESEL-SOA	POWR	83.	9.	28.	4.	10.	3.	83.	0.	111	DISTILLA	111.	0	0.11	0.03	0.67
29	DESOA3	DIESEL-SOA	HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88	DISTILLA	120.	110	-0.00	0.	0.62
29	DESOA3	DIESEL-SOA	POWR	83.	9.	28.	4.	10.	3.	83.	0.	111	RESIDUAL	111.	0	0.11	0.09	0.67
29	DESOA3	DIESEL-SOA	HEAT	88.	0.	0.	0.	0.	0.	88.	32	88	RESIDUAL	120.	110	-0.00	C	0.62

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEG ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24361 MW 3.00 PROCESS MILLIONS BTU/HR 75.0 PROCESS TEMP(F) 406 PRODUCT SOFT-PLYWOOD HOURS PER YEAR 6000

POWER TO HEAT RATIO 0.136

UTILITY FUEL COAL WASTE FUEL TOV BTU*10**6= 100. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NS-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	81.	11.	28	6.	10.	3.	81	0.	103	DISTILLA	109.	1	0.11	0.09	0.69
30 DESOA2 DIESEL-SOA HEAT	88.	0	0.	0	0.	0.	88	32	88	DISTILLA	120.	111	-0.00	0	0.62
30 DESOA2 DIESEL-SOA POWR	81.	11	28.	6.	10	3.	81	0.	109	RESIDUAL	109	1	0.11	0.09	0.69
30 DESOA2 DIESEL-SOA HEAT	88.	0	0.	0.	0	0.	88	32.	88	RESIDUAL	120.	111	-0.00	0	0.62
31 DESOA1 DIESEL-SOA POWR	75.	17	28.	11.	10	3.	75	0	103	DISTILLA	103.	1	0.11	0.10	0.73
31 DESOA1 DIESEL-SOA HEAT	88	0	0.	0	0	0.	88	32	88	DISTILLA	120.	111	-0.00	0	0.62
31 DESOA1 DIESEL-SOA POWR	75.	17	28.	11	10.	3.	75.	0.	103	RESIDUAL	103	1	0.11	0.10	0.73
31 DESOA1 DIESEL-SOA HEAT	88.	0	0	0	0.	0.	88	32	88	RESIDUAL	120.	111	-0.00	0	0.62
32 GTSOAD GT-HRSG-10 POWR	69.	16.	35	16	10.	3.	69	0	104	DISTILLA	104.	10	-0.10	0.10	0.72
32 GTSOAD GT-HRSG-10 HEAT	88.	0.	0	0	0.	0.	88	32.	88	DISTILLA	120	110	-0.00	0	0.62
33 GTRA08 GT-85RE-08 POWR	78.	14.	29.	9	10	3.	78	0	106	DISTILLA	106.	10	0.10	0.10	0.71
33 GTRA08 GT-85RE-08 HEAT	88.	0.	0.	0	0.	0	88	32.	88	DISTILLA	120.	110	-0.00	0	0.62
34 GTRA12 GT-85RE-12 POWR	77.	15.	29	9	10	3.	77	0	106	DISTILLA	10	.0	0.11	0.10	0.71
34 GTRA12 GT-85RE-12 HEAT	88	0.	0	0	0	0.	88	32.	88	DISTILLA	12	0	-0.00	0.	0.62
35 GTRA16 GT-85RE-16 POWR	76.	15.	29.	10	10.	3.	76.	0.	106	DISTILLA	103	10	0.06	0.10	0.71
35 GTRA16 GT-85RE-16 HEAT	88.	0	0	0	0	0.	88	32	88	DISTILLA	120	110	-0.00	0	0.62
36 GTR208 GT-50RE-08 POWR	73.	15.	32.	13.	10.	3.	73.	0.	105	DISTILLA	103	10	-0.00	0.10	0.71
36 GTR208 GT-50RE-08 HEAT	88.	0	0.	0.	0.	0.	88.	32.	88	DISTILLA	120.	110	-0.00	0.	0.62
37 GTR212 GT-50RE-12 POWR	74.	15.	31	12.	10.	3.	74	0.	105	DISTILLA	105.	10	0.03	0.10	0.71
37 GTR212 GT-50RE-12 HEAT	88.	0.	0.	0.	0	0.	88	32.	88	DISTILLA	120.	110	-0.00	0	0.62
38 GTR216 GT-50RE-16 POWR	75.	15	30.	11	10.	3.	75.	0	105	DISTILLA	105.	10	0.05	0.10	0.71
38 GTR216 GT-50RE-16 HEAT	88	0	0	0	0.	0.	88	32.	88	DISTILLA	120.	110	-0.00	0	0.62
39 GTRW08 GT-85RE-08 POWR	79.	12.	29.	8.	10.	3.	79.	0.	108	DISTILLA	108.	10	0.09	0.09	0.69
39 GTRW08 GT-85RE-08 HEAT	88.	0.	0.	0.	0.	0.	88	32.	88	DISTILLA	120.	110	-0.00	0.	0.62
40 GTRW12 GT-85RE-12 POWR	79	13	28.	8.	10.	3.	79.	0.	107	DISTILLA	107.	10	0.12	0.10	0.70
40 GTRW12 GT-85RE-12 HEAT	88.	0.	0.	0.	0.	0.	88	32.	88	DISTILLA	120.	110	-0.00	0	0.62

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24361 MW 3.00 PROCESS MILLIONS BTU/HR 75.0 PROCESS TEMP(F) 406. PRODUCT SOFT-PLYWOOD HOURS PER YEAR 6000.

POWER TO HEAT RATIO 0.136

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 100. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	78.	13.	29.	8.	10.	3.	78.	0.	107.	DISTILLA	107.	10	0.10	0.10	0.70
41 GTRW16 GT-85RE-16 HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	DISTILLA	120.	110	-0.00	0.	0.62
42 GTR308 GT-60RE-08 POWR	76.	11.	33.	10.	10.	3.	76.	0.	109.	DISTILLA	109.	10	-0.03	0.09	0.69
42 GTR308 GT-60RE-08 HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	DISTILLA	120.	110	-0.00	0.	0.62
43 GTR312 GT-60RE-12 POWR	77.	14.	30.	10.	10.	3.	77.	0.	107.	DISTILLA	107.	10	0.06	0.10	0.70
43 GTR312 GT-60RE-12 HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	DISTILLA	120.	110	-0.00	0.	0.62
44 GTR316 GT-60RE-16 POWR	77.	13.	30.	10.	10.	3.	77.	0.	107.	DISTILLA	107.	10	0.06	0.10	0.70
44 GTR316 GT-60RE-16 HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	DISTILLA	120.	110	-0.00	0.	0.62
45 FCPADS FUEL-CL-PH POWR	83.	10.	27.	5.	10.	3.	83.	0.	110.	DISTILLA	110.	0	0.16	0.09	0.68
45 FCPADS FUEL-CL-PH HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	DISTILLA	120.	110	-0.00	0.	0.62
46 FCMCDS FUEL-CL-MO POWR	81.	14.	25.	6.	10.	3.	81.	0.	106.	DISTILLA	106.	10	0.22	0.10	0.71
46 FCMCDS FUEL-CL-MO HEAT	88.	0.	0.	0.	0.	0.	88.	32.	88.	DISTILLA	120.	110	-0.00	0.	0.62

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24921 MW 5.00 PROCESS MILLIONS BTU/HR 37.0 PROCESS TEMP(F) 406. PRODUCT PARTICLE-BOA HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.461

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	41.	0.	0.	0.	0.	0.	44.	53.	44.	COAL-AFB	97.	0	0.	0.18	0.38
1 STM141 STM-TURB-1 POWR	41.	-62.	159.	118.	17.	5.	-95.	0.	159.	RESIDUAL	159.	10	-1.11	0.11	0.23
1 STM141 STM-TURB-1 HEAT	41.	10.	50.	37.	5.	2.	0.	37.	50.	RESIDUAL	86.	10	0.19	0.06	0.43
1 STM141 STM-TURB-1 POWR	41.	-62.	159.	118.	17.	5.	-95.	0.	159.	COAL-FGD	159.	10	-1.11	0.11	0.23
1 STM141 STM-TURB-1 HEAT	41.	10.	50.	37.	5.	2.	0.	37.	50.	COAL-FGD	86.	10	0.19	0.06	0.43
1 STM141 STM-TURB-1 POWR	41.	-62.	159.	118.	17.	5.	-95.	0.	159.	COAL-AFB	159.	10	-1.11	0.11	0.23
1 STM141 STM-TURB-1 HEAT	41.	10.	50.	37.	5.	2.	0.	37.	50.	COAL-AFB	86.	10	0.19	0.06	0.43
2 STM088 STM-TURB-8 POWR	41.	-141.	237.	185.	17.	5.	-174.	0.	237.	RESIDUAL	237.	0	-2.53	0.07	0.16
2 STM088 STM-TURB-8 HEAT	41.	7.	48.	37.	3.	1.	0.	43.	48.	RESIDUAL	90.	10	0.12	0.04	0.41
2 STM088 STM-TURB-8 POWR	41.	-141.	237.	185.	17.	5.	-174.	0.	237.	COAL-FGD	237.	0	-2.53	0.07	0.16
2 STM088 STM-TURB-8 HEAT	41.	7.	48.	37.	3.	1.	0.	43.	48.	COAL-FGD	90.	10	0.12	0.04	0.41
2 STM088 STM-TURB-8 POWR	41.	-141.	237.	185.	17.	5.	-174.	0.	237.	COAL-AFB	237.	0	-2.53	0.07	0.16
2 STM088 STM-TURB-8 HEAT	41.	7.	48.	37.	3.	1.	0.	43.	48.	COAL-AFB	90.	10	0.12	0.04	0.41
3 PFBSTM PFB-STMTB- POWR	41.	1.	96.	63.	17.	5.	-31.	0.	96.	COAL-PFB	96.	10	0.02	0.18	0.39
3 PFBSTM PFB-STMTB- HEAT	41.	19.	56.	37.	10.	3.	0.	22.	56.	COAL-PFB	78.	10	0.34	0.13	0.47
4 TISTMT TI-STMTB-1 POWR	0.	22.	75.	46.	17.	5.	-10.	0.	75.	RESIDUAL	75.	10	-0.34	0.23	0.50
4 TISTMT TI-STMTB-1 HEAT	41.	1.	3.	2.	1.	0.	41.	51.	44.	RESIDUAL	95.	10	0.03	0.01	0.39
4 TISTMT TI-STMTB-1 POWR	41.	22.	75.	46.	17.	5.	-10.	0.	75.	COAL	75.	10	0.40	0.23	0.50
4 TISTMT TI-STMTB-1 HEAT	41.	26.	60.	37.	14.	4.	0.	10.	60.	COAL	70.	10	0.47	0.20	0.53
5 TIHRSG THERMIONIC POWR	0.	-24.	121.	77.	17.	5.	-47.	0.	121.	RESIDUAL	121.	0	-1.18	0.14	0.31
5 TIHRSG THERMIONIC HEAT	41.	1.	3.	2.	0.	0.	41.	52.	44.	RESIDUAL	96.	10	0.01	0.00	0.38
5 TIHRSG THERMIONIC POWR	41.	-24.	121.	77.	17.	5.	-47.	0.	121.	COAL	121.	0	-0.44	0.14	0.31
5 TIHRSG THERMIONIC HEAT	41.	11.	59.	37.	8.	2.	0.	28.	59.	COAL	86.	10	0.19	0.10	0.43
6 STIRL STIRLING-1 POWR	3.	23.	70.	34.	17.	5.	3.	0.	74.	DISTILLA	74.	0	-0.27	0.23	0.50
6 STIRL STIRLING-1 HEAT	41.	1.	4.	2.	1.	0.	41.	50.	45.	DISTILLA	95.	10	0.02	0.01	0.39

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24921 MW 5.00 PROCESS MILLIONS BTU/HR 37.0 PROCESS TEMP(F) 406 PRODUCT PARTICLE-BOA HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.461

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	3.	23.	70.	34.	17.	5.	3.	0.	74.	RESIDUAL	74.	0	-0.27	0.23	0.50
6 STIRL	STIRLING-1	HEAT	41.	1.	4.	2.	1.	0.	41.	50.	45.	RESIDUAL	95.	10	0.02	0.01	0.39
6 STIRL	STIRLING-1	POWR	41.	23.	70.	34.	17.	5.	3.	0.	74.	COAL	74.	0	0.42	0.23	0.50
6 STIRL	STIRLING-1	HEAT	41.	25.	76.	37.	18.	5.	0.	-4.	76.	COAL	72.	0	0.42	0.24	0.49
7 HEGT85	HELIUM-GT-	POWR	41.	4.	53.	3.	17.	[illegible]	40.	0.	93.	COAL-AFB	93.	11	0.06	0.18	0.40
7 HEGT85	HELIUM-GT-	HEAT	41.	46.	677.	37.	217.	64.	0.	-626.	677.	COAL-AFB	51.	1	0.07	0.32	0.05
8 HEGT60	HELIUM-GT-	POWR	41.	7.	66.	16.	17.	5.	24.	0.	90.	COAL-AFB	90.	10	0.12	0.19	0.41
8 HEGT60	HELIUM-GT-	HEAT	41.	15.	148.	37.	38.	11.	0.	-66.	148.	COAL-AFB	82.	10	0.13	0.26	0.25
9 HEGT00	HELIUM-GT-	POWR	41.	-0.	97.	46.	17.	5.	-11.	0.	97.	COAL-AFB	97.	10	-0.00	0.18	0.38
9 HEGT00	HELIUM-GT-	HEAT	41.	9.	77.	37.	14.	4.	0.	11.	77.	COAL-AFB	88.	10	0.16	0.15	0.42
10 FCMCCL	FUEL-CL-MO	POWR	0.	28.	56.	27.	17.	5.	12.	0.	68.	COAL	68.	10	-0.23	0.25	0.54
10 FCMCCL	FUEL-CL-MO	HEAT	0.	40.	78.	37.	24.	7.	0.	-21.	78.	COAL	57.	10	-0.02	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	29.	47.	19.	17.	5.	21.	0.	68.	COAL	68.	10	-0.21	0.25	0.55
11 FCSTCL	FUEL-CL-ST	HEAT	0.	55.	89.	37.	32.	10.	0.	-48.	89.	COAL	41.	10	0.14	0.36	0.42
12 IGGTST	INT-GAS-GT	POWR	0.	23.	65.	29.	17.	5.	10.	0.	74.	COAL	74.	10	-0.33	0.23	0.50
12 IGGTST	INT-GAS-GT	HEAT	0.	29.	83.	37.	22.	6.	0.	-15.	83.	COAL	68.	10	-0.17	0.26	0.45
13 GTSOAR	GT-HRSG-10	POWR	15.	23.	59.	24.	17.	5.	15.	0.	74.	RESIDUAL	74.	10	-0.06	0.23	0.50
13 GTSOAR	GT-HRSG-10	HEAT	41.	2.	5.	2.	1.	0.	41.	49.	46.	RESIDUAL	95.	10	0.03	0.01	0.39
14 GTAC08	GT-HRSG-08	POWR	5.	28.	63.	33.	17.	5.	5.	0.	68.	RESIDUAL	68.	10	-0.14	0.25	0.54
14 GTAC08	GT-HRSG-08	HEAT	41.	2.	4.	2.	1.	0.	41.	50.	45.	RESIDUAL	95.	10	0.03	0.01	0.39
15 GTAC12	GT-HRSG-12	POWR	13.	28.	56.	26.	17.	5.	13.	0.	69.	RESIDUAL	69.	10	-0.00	0.25	0.54
15 GTAC12	GT-HRSG-12	HEAT	41.	2.	4.	2.	1.	0.	41.	49.	45.	RESIDUAL	95.	10	0.04	0.01	0.39
16 GTAC16	GT-HRSG-16	POWR	17.	27.	53.	23.	17.	5.	17.	0.	70.	RESIDUAL	70.	10	0.05	0.24	0.53
16 GTAC16	GT-HRSG-16	HEAT	41.	2.	5.	2.	2.	0.	41.	49.	46.	RESIDUAL	94.	10	0.04	0.02	0.39
17 GTWC16	GT-HRSG-16	POWR	18.	25.	54.	22.	17.	5.	18.	0.	72.	RESIDUAL	72.	10	0.03	0.24	0.51
17 GTWC16	GT-HRSG-16	HEAT	41.	2.	5.	2.	2.	0.	41.	48.	46.	RESIDUAL	95.	10	0.04	0.02	0.39

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24921 MW 5.00 PROCESS MILLIONS BTU/HR 37.0 PROCESS TEMP(F) 406. PRODUCT PARTICLE-BOA HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.461

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	26.	24.	47.	15.	17.	5.	26.	C.	73.	RESIDUAL	73.	10	0.15	0.24	0.51
18 CC1626 GTST-16/26 HEAT	41.	3.	6.	2.	2.	1.	41.	46.	47.	RESIDUAL	94.	10	0.06	0.02	0.39
19 CC1622 GTST-16/22 POWR	23.	25.	48.	17.	17.	5.	23.	0.	71.	RESIDUAL	71.	10	0.14	0.24	0.52
19 CC1622 GTST-16/22 HEAT	41.	3.	6.	2.	2.	1.	41.	47.	47.	RESIDUAL	94.	10	0.05	0.02	0.39
20 CC1222 GTST-12/22 POWR	23.	26.	48.	17.	17.	5.	23.	0.	71.	RESIDUAL	71.	10	0.14	0.24	0.52
20 CC1222 GTST-12/22 HEAT	41.	3.	6.	2.	2.	1.	41.	47.	47.	RESIDUAL	94.	10	0.05	0.02	0.39
21 CC0822 GTST-08/22 POWR	18.	28.	51.	22.	17.	5.	18.	0.	69.	RESIDUAL	69.	10	0.08	0.25	0.53
21 CC0822 GTST-08/22 HEAT	41.	3.	5.	2.	2.	0.	41.	48.	46.	RESIDUAL	94.	10	0.05	0.02	0.39
22 STIG15 STIG-15-16 POWR	41.	9.	45.	1.	17.	5.	43.	0.	88.	RESIDUAL	88.	10	0.17	0.19	0.42
22 STIG15 STIG-15-16 HEAT	41.	32.	154.	2.	59.	17.	41.	-130.	195.	RESIDUAL	65.	10	0.17	0.30	0.19
23 STIG10 STIG-10-16 POWR	36.	13.	48.	6.	17.	5.	36.	0.	84.	RESIDUAL	84.	10	0.15	0.20	0.44
23 STIG10 STIG-10-16 HEAT	41.	4.	15.	2.	5.	2.	41.	38.	56.	RESIDUAL	93.	10	0.08	0.06	0.40
24 STIG1S STIG-1S-16 POWR	31.	15.	51.	11.	17.	5.	31.	0.	82.	RESIDUAL	82.	10	0.09	0.21	0.45
24 STIG1S STIG-1S-16 HEAT	41.	3.	9.	2.	3.	1.	41.	43.	51.	RESIDUAL	94.	10	0.05	0.03	0.39
25 DEADV3 DIESEL-ADV POWR	33.	18.	46.	9.	17.	5.	33.	0.	79.	RESIDUAL	79.	0	0.17	0.22	0.47
25 DEADV3 DIESEL-ADV HEAT	41.	4.	11.	2.	4.	1.	41.	41.	52.	RESIDUAL	93.	10	0.07	0.04	0.40
26 DEADV2 DIESEL-ADV POWR	30.	21.	46.	12.	17.	5.	30.	0.	76.	RESIDUAL	76.	1	0.17	0.23	0.49
26 DEADV2 DIESEL-ADV HEAT	41.	4.	8.	2.	3.	1.	41.	44.	49.	RESIDUAL	93.	11	0.06	0.03	0.40
27 DEADV1 DIESEL-ADV POWR	22.	28.	46.	18.	17.	5.	22.	0.	68.	RESIDUAL	68.	1	0.17	0.25	0.54
27 DEADV1 DIESEL-ADV HEAT	41.	3.	5.	2.	2.	1.	41.	47.	46.	RESIDUAL	94.	11	0.06	0.02	0.39
28 DEHTPM ADV-DIESEL POWR	16.	26.	55.	23.	17.	5.	16.	0.	71.	RESIDUAL	71.	0	0.01	0.24	0.52
28 DEHTPM ADV-DIESEL HEAT	41.	2.	5.	2.	1.	0.	41.	49.	46.	RESIDUAL	95.	10	0.04	0.02	0.39
29 DESOA3 DIESEL-SOA POWR	35.	15.	47.	7.	17.	5.	35.	0.	82.	DISTILLA	82.	0	0.15	0.21	0.45
29 DESOA3 DIESEL-SOA HEAT	41.	4.	13.	2.	5.	1.	41.	39.	54.	DISTILLA	93.	0	0.07	0.05	0.40
29 DESOA3 DIESEL-SOA POWR	35.	15.	47.	7.	17.	5.	35.	0.	82.	RESIDUAL	82	0	0.15	0.21	0.45
29 DESOA3 DIESEL-SOA HEAT	41.	4.	13.	2.	5.	1.	41.	39.	54.	RESIDUAL	93.	0	0.07	0.05	0.40

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24:21 MW 5.00 PROCESS MILLIONS BTU/HR 37.0 PROCESS TEMP(F) 406. PRODUCT PARTICLE-BOA HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.461

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6* 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	31.	18.	47.	10.	17.	5.	31.	0.	79.	DISTILLA	79.	1	0.15	0.22	0.47
30	DESOA2	DIESEL-SOA	HEAT	41.	4.	9.	2.	3.	1.	41.	43.	50.	DISTILLA	93.	1	0.06	0.04	0.40
30	DESOA2	DIESEL-SOA	POWR	31.	18.	47.	10.	17.	5.	31.	0.	79.	RESIDUAL	79.	1	0.15	0.22	0.47
30	DESOA2	DIESEL-SOA	HEAT	41.	4.	9.	2.	3.	1.	41.	43.	50.	RESIDUAL	93.	1	0.06	0.04	0.40
31	DESOA1	DIESEL-SOA	POWR	21.	28.	47.	19.	17.	5.	21.	0.	68.	DISTILLA	68.	1	0.15	0.25	0.54
31	DESOA1	DIESEL-SOA	HEAT	41.	3.	5.	2.	2.	1.	41.	48.	46.	DISTILLA	94.	1	0.05	0.02	0.39
31	DESOA1	DIESEL-SOA	POWR	21.	28.	47.	19.	17.	5.	21.	0.	68.	RESIDUAL	68.	1	0.15	0.25	0.54
31	DESOA1	DIESEL-SOA	HEAT	41.	3.	5.	2.	2.	1.	41.	48.	46.	RESIDUAL	94.	1	0.05	0.02	0.39
32	GTSOAD	GT-HRSG-10	POWR	12.	26.	58.	27.	17.	5.	12.	0.	71.	DISTILLA	71.	10	-0.05	0.24	0.52
32	GTSOAD	GT-HRSG-10	HEAT	41.	2.	4.	2.	1.	0.	41.	49.	46.	DISTILLA	95.	10	0.04	0.01	0.39
33	GTRA08	GT-85RE-08	POWR	26.	23.	48.	15.	17.	5.	26.	0.	73.	DISTILLA	73.	10	0.14	0.23	0.50
33	GTRA08	GT-85RE-08	HEAT	41.	3.	6.	2.	2.	1.	41.	46.	47.	DISTILLA	94.	10	0.06	0.02	0.39
34	GTRA12	GT-85RE-12	POWR	25.	24.	48.	16.	17.	5.	25.	0.	73.	DISTILLA	73.	10	0.14	0.23	0.51
34	GTRA12	GT-85RE-12	HEAT	41.	3.	6.	2.	2.	1.	41.	47.	47.	DISTILLA	94.	10	0.06	0.02	0.39
35	GTRA16	GT-85RE-16	POWR	23.	25.	49.	17.	17.	5.	23.	0.	72.	DISTILLA	72.	10	0.12	0.24	0.51
35	GTRA16	GT-85RE-16	HEAT	41.	3.	6.	2.	2.	1.	41.	47.	47.	DISTILLA	94.	10	0.05	0.02	0.39
36	GTR208	GT-60RE-08	POWR	19.	25.	53.	21.	17.	5.	19.	0.	72.	DISTILLA	72.	10	0.04	0.24	0.51
36	GTR208	GT-60RE-08	HEAT	41.	2.	5.	2.	2.	0.	41.	48.	46.	DISTILLA	94.	10	0.04	0.02	0.39
37	GTR212	GT-60RE-12	POWR	21.	25.	52.	19.	17.	5.	21.	0.	72.	DISTILLA	72.	10	0.07	0.24	0.51
37	GTR212	GT-60RE-12	HEAT	41.	3.	5.	2.	2.	1.	41.	48.	46.	DISTILLA	94.	10	0.05	0.02	0.39
38	GTR216	GT-60RE-16	POWR	21.	25.	51.	19.	17.	5.	21.	0.	72.	DISTILLA	72.	10	0.09	0.24	0.52
38	GTR216	GT-60RE-16	HEAT	41.	3.	5.	2.	2.	1.	41.	48.	47.	DISTILLA	94.	10	0.05	0.02	0.39
39	GTRW08	GT-85RE-08	POWR	28.	20.	49.	13.	17.	5.	28.	0.	77.	DISTILLA	77.	10	0.13	0.22	0.48
39	GTRW08	GT-85RE-08	HEAT	41.	3.	8.	2.	3.	1.	41.	45.	49.	DISTILLA	94.	10	0.06	0.03	0.39
40	GTRW12	GT-85RE-12	POWR	29.	21.	47.	13.	17.	5.	29.	0.	75.	DISTILLA	75.	10	0.16	0.23	0.49
40	GTRW12	GT-85RE-12	HEAT	41.	3.	7.	2.	3.	1.	41.	45.	49.	DISTILLA	93.	10	0.06	0.03	0.40

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 24921 MW 5.00 PROCESS MILLIONS BTU/HR 37.0 PROCESS TEMP(F) 406. PRODUCT PARTICLE-BOA HOURS PER YEAR 8000.

POWER TO HEAT RATIO 0.461

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	27.	22.	48.	14.	17.	5.	27.	0.	75.	DISTILLA	75.	10	0.14	0.23	0.49
41 GTRW16 GT-85RE-16 HEAT	41.	3.	7.	2.	2.	1.	41.	46.	48.	DISTILLA	94.	10	0.06	0.03	0.39
42 GTR308 GT-60RE-08 POWR	24.	18.	55.	17.	17.	5.	24.	0.	79.	DISTILLA	79.	10	0.01	0.22	0.47
42 GTR308 GT-60RE-08 HEAT	41.	2.	7.	2.	2.	1.	41.	47.	48.	DISTILLA	95.	10	0.04	0.02	0.39
43 GTR312 GT-60RE-12 POWR	24.	23.	50.	16.	17.	5.	24.	0.	74.	DISTILLA	74.	10	0.10	0.23	0.50
43 GTR312 GT-60RE-12 HEAT	41.	3.	6.	2.	2.	1.	41.	47.	47.	DISTILLA	94.	10	0.05	0.02	0.39
44 GTR316 GT-60RE-16 POWR	24.	22.	50.	17.	17.	5.	24.	0.	74.	DISTILLA	74.	10	0.10	0.23	0.50
44 GTR316 GT-60RE-16 HEAT	41.	3.	6.	2.	2.	1.	41.	47.	47.	DISTILLA	94.	10	0.05	0.02	0.39
45 FCPADS FUEL-CL-PH POWR	35.	17.	45.	8.	17.	5.	35.	0.	79.	DISTILLA	79.	0	0.19	0.21	0.47
45 FCPADS FUEL-CL-PH HEAT	41.	5.	12.	2.	4.	1.	41.	39.	53.	DISTILLA	92.	0	0.08	0.05	0.40
46 FCMCDS FUEL-CL-MO POWR	32.	23.	41.	10.	17.	5.	32.	0.	74.	DISTILLA	74.	0	0.26	0.23	0.50
46 FCMCDS FUEL-CL-MO HEAT	41.	5.	9.	2.	4.	1.	41	42.	50.	DISTILLA	92.	10	0.09	0.04	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26212 MW 50.00 PROCESS MILLIONS BTU/HR 780.0 PROCESS TEMP(F) 366. PRODUCT BLEACHED-KRA HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.219

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	353.	0.	0.	0.	0.	0.	918.	533.	918.	COAL-FGD	1451.	0	0.	0.12	0.54
1 STM141 STM-TURB-1 POWR	353.	277.	1173.	827.	171.	50.	-55.	0.	1173.	RESIDUAL	1173.	0	0.25	0.15	0.66
1 STM141 STM-TURB-1 HEAT	353.	314.	1107.	780.	161.	47.	0.	30.	1107.	RESIDUAL	1137.	0	0.29	0.14	0.69
1 STM141 STM-TURB-1 POWR	353.	277.	1173.	827.	171.	50.	-55.	0.	1173.	COAL-FGD	1173.	0	0.25	0.15	0.66
1 STM141 STM-TURB-1 HEAT	353.	314.	1107.	780.	161.	47.	0.	30.	1107.	COAL-FGD	1137.	0	0.29	0.14	0.69
1 STM141 STM-TURB-1 POWR	353.	277.	1173.	827.	171.	50.	-55.	0.	1173.	COAL-AFB	1173.	0	0.25	0.15	0.66
1 STM141 STM-TURB-1 HEAT	353.	314.	1107.	780.	161.	47.	0.	30.	1107.	COAL-AFB	1137.	0	0.29	0.14	0.69
2 STM088 STM-TURB-8 POWR	353.	-89.	1540.	1138.	171.	50.	-421.	0.	1540.	RESIDUAL	1540.	0	-0.08	0.11	0.51
2 STM088 STM-TURB-8 HEAT	353.	228.	1055.	780.	117.	34.	0.	168.	1055.	RESIDUAL	1223.	0	0.21	0.10	0.64
2 STM088 STM-TURB-8 POWR	353.	-89.	1540.	1138.	171.	50.	-421.	0.	1540.	COAL-FGD	1540.	0	-0.08	0.11	0.51
2 STM088 STM-TURB-8 HEAT	353.	228.	1055.	780.	117.	34.	0.	168.	1055.	COAL-FGD	1223.	0	0.21	0.10	0.64
2 STM088 STM-TURB-8 POWR	353.	-89.	1540.	1138.	171.	50.	-421.	0.	1540.	COAL-AFB	1540.	0	-0.08	0.11	0.51
2 STM088 STM-TURB-8 HEAT	353.	228.	1055.	780.	117	34.	0.	168.	1055.	COAL-AFB	1223.	0	0.21	0.10	0.64
3 PFBSTM PFB-STMTB- POWR	353.	326.	806.	509.	171.	50.	319.	0.	1125.	COAL-PFB	1125.	0	0.30	0.15	0.69
3 PFBSTM PFB-STMTB- HEAT	353.	499.	1236.	780.	261.	77.	0.	-284.	1236.	COAL-PFB	952.	0	0.36	0.21	0.63
4 TISTMT TI-STMTB-1 POWR	353.	327.	654.	381.	171.	50.	469.	0.	1124.	RESIDUAL	1124.	0	0.30	0.15	0.69
4 TISTMT TI-STMTB-1 HEAT	353.	412.	824.	480.	215.	63.	353.	-138.	1177.	RESIDUAL	1039.	0	0.33	0.18	0.66
4 TISTMT TI-STMTB-1 POWR	353.	327.	654.	381.	171.	50.	469.	0.	1124.	COAL	1124.	0	0.30	0.15	0.69
4 TISTMT TI-STMTB-1 HEAT	353.	669.	1339.	780.	349.	102.	0.	-558.	1339.	COAL	781.	0	0.40	0.26	0.58
5 TIHRSG THERMIONIC POWR	0.	238.	1213.	783.	171.	50.	-4.	0.	1213.	RESIDUAL	1213.	0	-0.10	0.14	0.64
5 TIHRSG THERMIONIC HEAT	353.	148.	743.	480.	105.	31.	353.	206.	1096.	RESIDUAL	1303.	0	0.14	0.08	0.80
5 TIHRSG THERMIONIC POWR	353.	238.	1213.	783.	171.	50.	-4.	0.	1213.	COAL	1213.	0	0.22	0.14	0.64
5 TIHRSG THERMIONIC HEAT	353.	241.	1208.	780.	170.	50.	0.	2.	1208.	COAL	1210.	0	0.22	0.14	0.64
6 STIRL STIRLING-1 POWR	353.	236.	677.	323.	171.	50.	538.	0.	1215.	DISTILLA	1215.	0	0.22	0.14	0.64
6 STIRL STIRLING-1 HEAT	353.	351.	1006.	480.	253.	74.	353.	-259.	1359.	DISTILLA	1100.	0	0.26	0.19	0.57

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26212 MW 50.00 PROCESS MILLIONS BTU/HR 780.0 PROCESS TEMP(F) 366. PRODUCT BLEACHED-KRA HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.219

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	353.	236.	677	323.	171.	50.	538.	0.	1215.	RESIDUAL	1215.	0	0.22	0.14	0.64
6	STIRL	STIRLING-1	HEAT	353.	351.	1006.	480.	253.	74.	353.	-259.	1359.	RESIDUAL	1100.	0	0.26	0.19	0.57
6	STIRL	STIRLING-1	POWR	353.	236.	677.	323.	171.	50.	538.	0.	1215.	COAL	1215.	0	0.22	0.14	0.64
6	STIRL	STIRLING-1	HEAT	353.	570.	1635.	780.	412.	121.	0.	-754.	1635.	COAL	881.	0	0.31	0.25	0.48
7	HEGT85	HELIUM-GT-	POWR	353.	76.	531.	63.	171.	50.	844.	0.	1375.	COAL-AFB	1375.	0	0.07	0.12	0.57
7	HEGT85	HELIUM-GT-	HEAT	353.	933.	6597.	780.	2118.	621.	0.	-6085.	6597.	COAL-AFB	513.	0	0.13	0.32	0.12
8	HEGT60	HELIUM-GT-	POWR	353.	100.	659.	191.	171.	50.	692.	0.	1351.	COAL-AFB	1351.	0	0.09	0.13	0.58
8	HEGT60	HELIUM-GT-	HEAT	353.	406.	2684.	780.	695.	204.	0.	-1639.	2684.	COAL-AFB	1045.	0	0.15	0.26	0.29
9	HEGT00	HELIUM-GT-	POWR	353.	121.	969.	473.	171.	50.	361.	0.	1330.	COAL-AFB	1330.	0	0.11	0.13	0.59
9	HEGT00	HELIUM-GT-	HEAT	353.	199.	1597.	780.	281.	82.	0.	-345.	1597.	COAL-AFB	1252.	0	0.14	0.18	0.49
10	FCMCCL	FUEL-CL-MO	POWR	0.	284.	561.	266.	171.	50.	605.	0.	1166.	COAL	1166.	10	-0.06	0.15	0.67
10	FCMCCL	FUEL-CL-MO	HEAT	0.	835.	1648.	780.	501.	147.	0.	-1032.	1648.	COAL	616.	0	0.23	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	295.	443.	175.	171.	50.	712.	0.	1155.	COAL	1155.	10	-0.05	0.15	0.68
11	FCSTCL	FUEL-CL-ST	HEAT	0.	1318.	1978.	780.	761.	223.	0.	-1844.	1978.	COAL	133.	0	0.33	0.38	0.39
12	IGGTST	INT-GAS-GT	POWR	0.	234.	595.	252.	171.	50.	622.	0.	1216.	COAL	1216.	10	-0.11	0.14	0.64
12	IGGTST	INT-GAS-GT	HEAT	0.	727.	1843.	780.	529.	155.	0.	-1120.	1843.	COAL	724.	0	0.17	0.29	0.42
13	GTSOAR	GT-HRSG-10	POWR	353.	238.	588.	249.	171.	50.	624.	0.	1212.	RESIDUAL	1212.	0	0.22	0.14	0.64
13	GTSOAR	GT-HRSG-10	HEAT	353.	459.	1132.	480.	328.	96.	353.	-493.	1485.	RESIDUAL	992.	0	0.29	0.22	0.53
14	GTAC08	GT-HRSG-08	POWR	353.	284.	632.	325.	171.	50.	535.	0.	1167.	RESIDUAL	1167.	0	0.26	0.15	0.67
14	GTAC08	GT-HRSG-08	HEAT	353.	419.	933.	460.	252.	74.	353.	-254.	1286.	RESIDUAL	1032.	0	0.31	0.20	0.61
15	GTAC12	GT-HRSG-12	POWR	353.	279.	559.	260.	171.	50.	612.	0.	1172.	RESIDUAL	1172.	0	0.25	0.15	0.67
15	GTAC12	GT-HRSG-12	HEAT	353.	516.	1034.	480.	315.	92.	353.	-452.	1387.	RESIDUAL	935.	0	0.33	0.23	0.56
16	GTAC16	GT-HRSG-16	POWR	353.	274.	528.	228.	171.	50.	649.	0.	1177.	RESIDUAL	1177.	0	0.25	0.14	0.66
16	GTAC16	GT-HRSG-16	HEAT	353.	575.	1110.	480.	359.	105.	353.	-587.	1463.	RESIDUAL	876.	0	0.34	0.25	0.53
17	GTWC16	GT-HRSG-16	POWR	353.	249.	542.	219.	171.	50.	660.	0.	1201.	RESIDUAL	1201.	0	0.23	0.14	0.65
17	GTWC16	GT-HRSG-16	HEAT	353.	546.	1186.	480.	374.	110.	353.	-535.	1539.	RESIDUAL	905.	0	0.32	0.24	0.51

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26212 MW 50.00 PROCESS MILLIONS BTU/HR 780.0 PROCESS TEMP(F) 366. PRODUCT BLEACHED-KRA HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.219

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	353.	246.	450.	139.	171.	50.	754.	0.	1204.	RESIDUAL	1204.	0	0.22	0.14	0.65
18 CC1626 GTST-16/26 HEAT	353.	851.	1555.	480.	589.	173.	353.	-1309.	1908.	RESIDUAL	599.	0	0.35	0.31	0.41
19 CC1622 GTST-16/22 POWR	353.	258.	456.	154.	171.	50.	736.	0.	1192.	RESIDUAL	1192.	0	0.24	0.14	0.65
19 CC1622 GTST-16/22 HEAT	353.	803.	1418.	480.	530.	155.	353.	-1124.	1771.	RESIDUAL	647.	0	0.36	0.30	0.44
20 CC1222 GTST-12/22 POWR	353.	261.	455.	155.	171.	50.	735.	0.	1190.	RESIDUAL	1190.	0	0.24	0.14	0.66
20 CC1222 GTST-12/22 HEAT	353.	807.	1407.	480.	528.	155.	353.	-1116.	1759.	RESIDUAL	644.	0	0.36	0.30	0.44
21 CC0822 GTST-08/22 POWR	353.	280.	483.	195.	171.	50.	688.	0.	1171.	RESIDUAL	1171.	0	0.25	0.15	0.67
21 CC0822 GTST-08/22 HEAT	353.	688.	1199.	480.	420.	123.	353.	-779.	1542.	RESIDUAL	763.	0	0.37	0.27	[illegible]
22 STIG15 STIG-15-16 POWR	353.	92.	448.	6.	171.	50.	911.	0.	1359.	RESIDUAL	1359.	0	0.08	0.13	0.57
22 STIG15 STIG-15-16 HEAT	353.	7603.	36923.	480.	14068.	4123.	353.	-43428.	37276.	RESIDUAL	-6152.	0	0.17	0.38	0.02
23 STIG10 STIG-10-16 POWR	353.	132.	475.	63.	171.	50.	844.	0.	1319.	RESIDUAL	1319.	0	0.12	0.13	0.59
23 STIG10 STIG-10-16 HEAT	353.	1007.	3623.	480.	1301.	381.	353.	-3532.	3976.	RESIDUAL	443.	0	0.22	0.33	0.20
24 STIGIS STIG-IS-16 POWR	353.	150.	509.	107.	171.	50.	791.	0.	1300.	RESIDUAL	1300.	0	0.14	0.13	0.60
24 STIGIS STIG-IS-16 HEAT	353.	673.	2277.	480.	763.	224.	353.	-1852.	2630.	RESIDUAL	778.	0	0.23	0.29	0.30
25 DEADV3 DIESEL-ADV POWR	353.	184.	460.	94.	171.	50.	807.	0.	1267.	RESIDUAL	1267.	0	0.17	0.13	0.62
25 DEADV3 DIESEL-ADV HEAT	353.	938.	2342.	480.	869.	255.	353.	-2182.	2695.	RESIDUAL	513.	0	0.29	0.32	0.29
26 DEADV2 DIESEL-ADV POWR	353.	211.	460.	117.	171.	50.	780.	0.	1240.	RESIDUAL	1240.	1	0.19	0.14	0.63
26 DEADV2 DIESEL-ADV HEAT	353.	866.	[illegible]	480.	701.	205.	353.	-1658.	2243.	RESIDUAL	585.	1	0.31	0.31	0.35
27 DEADV1 DIESEL-ADV POWR	353.	285.	460.	180.	171.	50.	706.	0.	1166.	RESIDUAL	1166.	1	0.26	0.15	0.67
27 DEADV1 DIESEL-ADV HEAT	353.	760.	1228.	480.	455.	133.	353.	-890.	1581.	RESIDUAL	690.	1	0.38	0.29	0.49
28 DEHTPM ADV-DIESEL POWR	353.	274.	522.	224.	171.	50.	655.	0.	1176.	RESIDUAL	1176.	0	0.25	0.15	0.66
28 DEHTPM ADV-DIESEL HEAT	353.	589.	1120.	480.	366.	107.	353.	-612.	1473.	RESIDUAL	862.	0	0.34	0.25	0.53
29 DESOA3 DIESEL-SOA POWR	353.	156.	473.	81.	171.	50.	823.	0.	1295.	DISTILLA	1295.	0	0.14	0.13	0.60
29 DESOA3 DIESEL-SOA HEAT	353.	924.	2807.	480.	1013.	297.	353.	-2634.	3160.	DISTILLA	526.	0	0.25	0.32	0.25
29 DESOA3 DIESEL-SOA POWR	353.	156.	473.	81.	171.	50.	823.	0.	1295.	RESIDUAL	1295.	0	0.14	0.13	0.60
29 DESOA3 DIESEL-SOA HEAT	353.	924.	2807.	480.	1013.	297.	353.	-2634.	3160.	RESIDUAL	526.	0	0.25	0.32	0.25

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26212 MW 50.00 PROCESS MILLIONS BTU/HR 780.0 PROCESS TEMP(F) 366. PRODUCT BLEACHED-KRA HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.219

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	353.	183.	473.	104.	171.	50.	795.	0.	1268.	DISTILLA	1268.	1	0.17	0.13	0.62
30 DESOA2 DIESEL-SOA HEAT	353.	844.	2182.	480.	788.	231.	353.	-1928.	2535.	DISTILLA	607.	1	0.28	0.31	0.31
30 DESOA2 DIESEL-SOA POWR	353.	183.	473.	104.	171.	50.	795.	0.	1268.	RESIDUAL	1268.	1	0.17	0.13	0.62
30 DESOA2 DIESEL-SOA HEAT	353.	844.	2182.	480.	788.	231.	353.	-1928.	2535.	RESIDUAL	607.	1	0.28	0.31	0.31
31 DESOA1 DIESEL-SOA POWR	353.	283.	473.	190.	171.	50.	695.	0.	1167.	DISTILLA	1167.	1	0.26	0.15	0.67
31 DESOA1 DIESEL-SOA HEAT	353.	718.	1197.	480.	432.	127.	353.	-817.	1550.	DISTILLA	733.	1	0.37	0.28	0.50
31 DESOA1 DIESEL-SOA POWR	353.	283.	473.	190.	171.	50.	695.	0.	1167.	RESIDUAL	1167.	1	0.26	0.15	0.67
31 DESOA1 DIESEL-SOA HEAT	353.	718.	1197.	480.	432.	127.	353.	-817.	1550.	RESIDUAL	733.	1	0.37	0.28	0.50
32 GTSOAD GT-HRSG-10 POWR	353.	265.	584.	269.	171.	50.	601.	0.	1185.	DISTILLA	1185.	0	0.24	0.14	0.66
32 GTSOAD GT-HRSG-10 HEAT	353.	474.	1042.	480.	304.	89.	353.	-418.	1395.	DISTILLA	977.	0	0.31	0.22	0.56
33 GTRA08 GT-85RE-08 POWR	353.	244.	478.	161.	171.	50.	729.	0.	1206.	DISTILLA	1206.	0	0.22	0.14	0.65
33 GTRA08 GT-85RE-08 HEAT	353.	730.	1428.	480.	510.	149.	353.	-1059.	1780.	DISTILLA	721.	0	0.34	0.29	0.44
34 GTRA12 GT-85RE-12 POWR	353.	251.	477.	165.	171.	50.	724.	0.	1200.	DISTILLA	1200.	0	0.23	0.14	0.65
34 GTRA12 GT-85RE-12 HEAT	353.	729.	1386.	480.	496.	145.	353.	-1018.	1739.	DISTILLA	721.	0	0.34	0.29	0.45
35 GTRA16 GT-85RE-16 POWR	353.	253.	489.	177.	171.	50.	709.	0.	1198.	DISTILLA	1198.	0	0.23	0.14	0.65
35 GTRA16 GT-85RE-16 HEAT	353.	685.	1325.	480.	462.	135.	353.	-912.	1678.	DISTILLA	766.	0	0.34	0.28	0.46
36 GTR208 GT-60RE-08 POWR	353.	252.	533.	214.	171.	50.	665.	0.	1199.	DISTILLA	1199.	0	0.23	0.14	0.65
36 GTR208 GT-60RE-08 HEAT	353.	565.	1194.	480.	382.	112.	353.	-661.	1547.	DISTILLA	886.	0	0.32	0.25	0.50
37 GTR212 GT-60RE-12 POWR	353.	251.	517.	200.	171.	50.	683.	0.	1199.	DISTILLA	1199.	0	0.23	0.14	0.65
37 GTR212 GT-60RE-12 HEAT	353.	604.	1242.	480.	410.	120.	353.	-747.	1594.	DISTILLA	847.	0	0.33	0.26	0.49
38 GTR216 GT-60RE-16 POWR	353.	256.	506.	195.	171.	50.	688.	0.	1195.	DISTILLA	1195.	0	0.23	0.14	0.65
38 GTR216 GT-60RE-16 HEAT	353.	631.	1247.	480.	420.	123.	353.	-780.	1600.	DISTILLA	820.	0	0.34	0.26	0.49
39 GTRW08 GT-85RE-08 POWR	353.	206.	486.	135.	171.	50.	759.	0.	1245.	DISTILLA	1245.	0	0.19	0.14	0.63
39 GTRW08 GT-85RE-08 HEAT	353.	732.	1731.	480.	607.	178.	353.	-1365.	2084.	DISTILLA	718.	0	0.30	0.29	0.37
40 GTRW12 GT-85RE-12 POWR	353.	221.	469.	133.	171.	50.	761.	0.	1230.	DISTILLA	1230.	0	0.20	0.14	0.63
40 GTRW12 GT-85RE-12 HEAT	353.	798.	1693.	480.	616.	181.	353.	-1393.	2046.	DISTILLA	653.	0	0.32	0.30	0.38

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26212 MW 50.00 PROCESS MILLIONS BTU/HR 780.0 PROCESS TEMP(F) 366. PRODUCT BLEACHED-KRA HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.219

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	CTRW16	GT-85RE-16	POWR	353.	224.	478.	144.	171.	50.	749.	0.	1227.	DISTILLA	1227.	0	0.20	0.14	0.64
41	GT[illegible]16	GT-85RE-16	HEAT	353.	749.	1597.	480.	570.	167.	353.	-1248.	1950.	DISTILLA	701	0	0.32	0.29	0.40
42	[illegible]8	GT-60RE-08	POWR	353.	190.	550.	177.	17[illegible].	50.	710.	0.	1260.	DISTILLA	1260.	0	0.17	0.14	0.62
42	GTR3[illegible]	GT-60RE-08	HEAT	353.	518.	1496.	480.	464.	136.	353.	-916.	1849.	DISTILLA	933.	0	0.26	0.25	0.42
43	GTR312	GT-60RE-12	POWR	353.	229.	499.	165.	171.	50.	723.	0.	1222.	DISTILLA	1222.	0	0.21	0.14	0.64
43	GTR312	GT-60RE-12	HEAT	353.	664.	1448.	480.	495.	145.	353.	-1015.	1801.	DISTILLA	787.	0	0.31	0.27	0.43
44	GTR316	GT-60RE-16	POWR	353.	227.	503.	168.	171.	50.	720.	0.	1223.	DISTILLA	1223.	0	0.21	0.14	0.64
44	GTR316	GT-60RE-16	HEAT	353.	650.	1438.	480.	488.	143.	353.	-991.	1791.	DISTILLA	801.	0	0.31	0.27	0.44
45	FCPADS	FUEL-CL-PH	POWR	353.	174.	449.	76.	171.	50.	828.	0.	1277.	DISTILLA	1277.	0	0.16	0.13	0.61
45	FCPADS	FUEL-CL-PH	HEAT	353.	1094.	2824.	480.	1073.	314.	353.	-2820.	3176.	DISTILLA	357.	0	0.28	0.34	0.25
46	FCMCDS	FUEL-CL-MO	POWR	353.	233.	414.	96.	171.	50.	804.	0.	1218.	DISTILLA	1218.	0	0.21	0.14	0.64
46	FCMCDS	FUEL-CL-MO	HEAT	353.	1157.	2060.	480.	849.	249.	353.	-2119.	2413.	DISTILLA	294.	0	0.36	0.35	0.32

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26214 MW 29.00 PROCESS MILLIONS BTU/HR 610.0 PROCESS TEMP(F) 366 PRODUCT UNBLEACHED-K HOURS PER YEAR 8400

POWER TO HEAT RATIO 0.162

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 259. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	259.	0.	0.	0.	0.	0.	718.	309.	718.	COAL-FGD	1027.	0	0.	0.10	0.59
1 STM141 STM-TURB-1 POWR	259.	193.	650.	453.	99.	29.	184.	0.	834.	RESIDUAL	834.	0	0.25	0.12	0.73
1 STM141 STM-TURB-1 HEAT	259.	259.	874.	610.	133.	39.	0.	-107.	874.	RESIDUAL	767.	0	0.30	0.15	0.70
1 STM141 STM-TURB-1 POWR	259.	193.	650.	453.	99.	29.	184.	0.	834.	COAL-FGD	834.	0	0.25	0.12	0.73
1 STM141 STM-TURB-1 HEAT	259.	259.	874.	610.	133.	39.	0.	-107.	874.	COAL-FGD	767.	0	0.30	0.15	0.70
1 STM141 STM-TURB-1 POWR	259.	193.	650.	453.	99.	29.	184.	0.	834.	COAL-AFB	834.	0	0.25	0.12	0.73
1 STM141 STM-TURB-1 HEAT	259.	259.	874.	610.	133.	39.	0.	-107.	874.	COAL-AFB	767.	0	0.30	0.15	0.70
2 STM088 STM-TURB-8 POWR	259.	187.	840.	615.	99.	29.	-6.	0.	840.	RESIDUAL	840.	0	0.24	0.12	0.73
2 STM088 STM-TURB-8 HEAT	259.	191.	833.	610.	98.	29.	0.	2.	833.	RESIDUAL	838.	0	0.25	0.12	0.73
2 STM088 STM-TURB-8 POWR	259.	187.	840.	615.	99.	29.	-6.	0.	840.	COAL-FGD	840.	0	0.24	0.12	0.73
2 STM088 STM-TURB-8 HEAT	259.	191.	833.	610.	98.	29.	0.	2.	833.	COAL-FGD	838.	0	0.25	0.12	0.73
2 STM088 STM-TURB-8 POWR	259.	187.	840.	615.	99.	29.	-6.	0.	840.	COAL-AFB	840.	0	0.24	0.12	0.73
2 STM088 STM-TURB-8 HEAT	259.	191.	833.	610.	98.	29.	0.	2.	833.	COAL-AFB	838.	0	0.25	0.12	0.73
3 PFBSTM PFB-STMTB- POWR	259.	189.	455.	284.	99.	29.	383.	0.	838.	COAL-PFB	838.	0	0.25	0.12	0.73
3 PFBSTM PFB-STMTB- HEAT	259.	406.	975.	610.	212.	62.	0.	-354.	975.	COAL-PFB	821.	0	0.36	0.22	0.63
4 TISTMT TI-STMTB-1 POWR	259.	190.	371.	214.	99.	29.	466.	0.	837.	RESIDUAL	837.	0	0.25	0.12	0.73
4 TISTMT TI-STMTB-1 HEAT	259.	346.	676.	390.	180.	53.	259.	-254.	935.	RESIDUAL	681.	0	0.34	0.19	0.65
4 TISTMT TI-STMTB-1 POWR	259.	190.	371.	214.	99.	29.	466.	0.	837.	COAL	837.	0	0.25	0.12	0.73
4 TISTMT TI-STMTB-1 HEAT	259.	540.	1058.	610.	282.	83.	0.	-571.	1058.	COAL	486.	0	0.40	0.27	0.58
5 TIHRSG THERMIONIC POWR	183.	140.	703.	454.	99.	29	183.	0.	887.	RESIDUAL	887.	0	0.08	0.11	0.69
5 TIHRSG THERMIONIC HEAT	259.	120.	604.	390.	85.	25.	259.	44.	863.	RESIDUAL	906.	0	0.16	0.09	0.67
5 TIHRSG THERMIONIC POWR	259.	140.	703.	454.	99.	29.	183.	0.	887.	COAL	887.	0	0.18	0.11	0.69
5 TIHRSG THERMIONIC HEAT	259.	188.	945.	610.	133.	39.	0.	-106.	945.	COAL	838.	0	0.[illegible]2	0.14	0.65
6 STIRL STIRLING-1 POWR	259.	137.	393.	187.	99.	29.	497.	0.	890.	DISTILLA	890.	0	0.18	0.11	0.69
6 STIRL STIRLING-1 HEAT	259.	285.	817.	390.	206.	60.	259.	-334.	1076.	DISTILLA	742.	0	0.26	0.19	0.57

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26214 MW 29.00 PROCESS MILLIONS BTU/HR 610.0 PROCESS TEMP(F) 366. PRODUCT UNBLEACHED-K HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.162

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 259. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	259.	137.	393.	187.	99.	29.	497.	0.	890.	RESIDUAL	890.	0	0.18	0.11	0.69
6 STIRL	STIRLING-1	HEAT	259.	285.	817.	390.	206.	60.	259.	-334.	1076.	RESIDUAL	742.	0	0.26	0.19	0.57
6 STIRL	STIRLING-1	POWR	259.	137.	393.	187.	99.	29.	497.	0.	890.	COAL	890.	0	0.18	0.11	0.69
6 STIRL	STIRLING-1	HEAT	259.	446.	1279.	610.	322.	94.	0.	-697.	1279.	COAL	581.	0	0.30	0.25	0.48
7 HEGT85	HELIUM-GT-	POWR	259.	44.	308.	36.	99.	29.	675.	0.	983.	COAL-AFB	983.	10	0.06	0.10	0.62
7 HEGT85	HELIUM-GT-	HEAT	259.	734.	5159.	610.	1656.	485.	0.	-4866.	5159.	COAL-AFB	293.	0	0.13	0.32	0.12
8 HEGT60	HELIUM-GT-	POWR	259.	53.	382.	111.	99.	29.	587.	0.	969.	COAL-AFB	969.	10	0.08	0.10	0.63
8 HEGT60	HELIUM-GT-	HEAT	259.	318.	2099.	610.	544.	159.	0.	-1390.	2099.	COAL-AFB	709.	0	0.15	0.26	0.29
9 HEGT00	HELIUM-GT-	POWR	259.	70.	562.	275.	99.	29.	395.	0.	957.	COAL-AFB	957.	10	0.09	0.10	0.64
9 HEGT00	HELIUM-GT-	HEAT	259.	156.	1249.	610.	220.	64.	0.	-378.	1249.	COAL-AFB	871.	0	0.14	0.18	0.49
10 FCMCCL	FUEL-CL-MO	POWR	0.	165.	325.	154.	99.	29.	536.	0.	862.	COAL	862.	10	-0.12	0.11	0.71
10 FCMCCL	FUEL-CL-MO	HEAT	0.	653.	1289.	610.	392.	115.	0.	-915.	1289.	COAL	374.	0	0.23	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	172.	255.	99.	99.	29.	601.	0.	855.	COAL	855.	10	-0.11	0.12	0.71
11 FCSTCL	FUEL-CL-ST	HEAT	0.	1052.	1562.	610.	607.	178.	0.	-1587.	1562.	COAL	-25.	0	0.34	0.39	0.39
12 IGGTST	INT-GAS-GT	POWR	0.	137.	340.	142.	99.	29.	550.	0.	890.	COAL	890.	10	-0.16	0.11	0.69
12 IGGTST	INT-GAS-GT	HEAT	0.	586.	1456.	610.	424.	124.	0.	-1015.	1456.	COAL	441.	0	0.18	0.29	0.42
13 GTSOAR	GT-HRSG-10	POWR	259.	138.	341.	145.	99.	29.	547.	0.	889.	RESIDUAL	889.	0	0.18	0.11	0.69
13 GTSOAR	GT-HRSG-10	HEAT	259.	373.	920.	390.	267.	78.	259.	-524.	1179.	RESIDUAL	654.	0	0.29	0.23	0.52
14 GTAC08	GT-HRSG-08	POWR	259.	165.	366.	189.	99.	29.	496.	0.	862.	RESIDUAL	862.	0	0.21	0.11	0.71
14 GTAC08	GT-HRSG-08	HEAT	259.	340.	758.	390.	205.	60.	259.	-330.	1017.	RESIDUAL	686.	0	0.31	0.20	0.60
15 GTAC12	GT-HRSG-12	POWR	259.	162.	324.	151.	99.	29.	540.	0.	865.	RESIDUAL	865.	0	0.21	0.11	0.71
15 GTAC12	GT-HRSG-12	HEAT	259.	419.	840.	390.	256.	75.	259.	-492.	1099.	RESIDUAL	607.	0	0.33	0.23	0.56
16 GTAC16	GT-HRSG-16	POWR	259.	159.	306.	132.	99.	29.	562.	0.	868.	RESIDUAL	868.	0	0.21	0.11	0.70
16 GTAC16	GT-HRSG-16	HEAT	259.	467.	902.	390.	291.	85.	259.	-601.	1161.	RESIDUAL	560.	0	0.34	0.25	0.53
17 GTWC16	GT-HRSG-16	POWR	259.	145.	314.	127.	99.	29.	568.	0.	882.	RESIDUAL	882.	0	0.19	0.11	0.69
17 GTWC16	GT-HRSG-16	HEAT	259.	444.	964.	390.	304.	89.	259.	-640.	1223.	RESIDUAL	583.	0	0.32	0.25	0.50

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26214 MW 29.00 PROCESS MILLIONS BTU/HR 610.0 PROCESS TEMP(F) 366. PRODUCT UNBLEACHED-K HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.162

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 259. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	259.	143.	259.	79.	99.	29.	625.	0.	884.	RESIDUAL	884.	0	0.19	0.11	0.69
18 CC1626 GTST-16/26 HEAT	259.	706.	1276.	390.	487.	143.	259.	-1214.	1535.	RESIDUAL	321.	0	0.36	0.32	0.40
19 CC1622 GTST-16/22 POWR	259.	150.	262.	88.	99.	29.	614.	0.	877.	RESIDUAL	877.	0	0.20	0.11	0.70
19 CC1622 GTST-16/22 HEAT	259.	666.	1163.	390.	439.	129.	259.	-1062.	1422.	RESIDUAL	361.	0	0.36	0.31	0.43
20 CC1222 GTST-12/22 POWR	259.	152.	261.	88.	99.	29.	614.	0.	875.	RESIDUAL	875.	0	0.20	0.11	0.70
20 CC1222 GTST-12/22 HEAT	259.	670.	1154.	390.	437.	128.	259.	-1056.	1413.	RESIDUAL	357.	0	0.37	0.31	0.43
21 CC0822 GTST-08/22 POWR	259.	162.	277.	111.	99.	29.	587.	0.	864.	RESIDUAL	864.	0	0.21	0.11	0.71
21 CC0822 GTST-08/22 HEAT	259.	572.	975.	390.	348.	102.	259.	-779.	1234.	RESIDUAL	455.	0	0.37	0.28	0.49
22 STIG15 STIG-15-16 POWR	259.	53.	260.	3.	99.	29.	714.	0.	973.	RESIDUAL	973.	0	0.07	0.!0	0.63
22 STIG15 STIG-15-16 HEAT	259.	6178.	30000.	390.	11430.	3350.	259.	-35410.	30259.	RESIDUAL	-5151.	0	0.17	0.38	0.02
23 STIG10 STIG-10-16 POWR	259.	77.	276.	37.	99.	29.	675.	0.	950.	RESIDUAL	950.	0	0.10	0.10	0.64
23 STIG10 STIG-10-16 HEAT	259.	818.	2943.	390.	1057.	310.	259.	-2994.	3202.	RESIDUAL	208.	0	0.22	0.33	0.19
24 STIG1S STIG-1S-16 POWR	259.	87.	295.	62.	99.	29.	644.	0.	940.	RESIDUAL	940.	0	0.11	0.11	0.65
24 STIG1S STIG-1S-16 HEAT	259.	547.	1850.	390.	620.	182.	259.	-1629.	2109.	RESIDUAL	480.	0	0.23	0.29	0.29
25 DEADV3 DIESEL-ADV POWR	259.	107.	267.	55.	99.	29.	653.	0.	920.	RESIDUAL	920.	0	0.14	0.11	0.66
25 DEADV3 DIESEL-ADV HEAT	259.	762.	1903.	390.	706.	207.	259.	-1897.	2161.	RESIDUAL	265.	0	0.29	0.33	0.28
26 DEADV2 DIESEL-ADV POWR	259.	122.	267.	68.	99.	29.	638.	0.	905.	RESIDUAL	905.	1	0.16	0.11	0.67
26 DEADV2 DIESEL-ADV HEAT	259.	704.	1535.	390.	570.	167.	259.	-1471.	1794.	RESIDUAL	323.	1	0.31	0.32	0.34
27 DEADV1 DIESEL-ADV POWR	259.	165.	267.	104.	99.	29.	595.	0.	862.	RESIDUAL	862.	1	0.22	0.11	0.71
27 DEADV1 DIESEL-ADV HEAT	259.	618.	997.	390.	370.	108.	259.	-847.	1256.	RESIDUAL	409.	1	0.38	0.29	0.49
28 DEHTPM ADV-DIESEL POWR	259.	159.	303.	130.	99.	29.	565.	0.	868.	RESIDUAL	868.	0	0.21	0.11	0.70
28 DEHTPM ADV-DIESEL HEAT	259.	479.	910.	390.	298.	87.	259.	-621.	1169.	RESIDUAL	548.	0	0.34	0.25	0.52
29 DESOA3 DIESEL-SOA POWR	259.	90.	274.	47.	99.	29.	663.	0.	937.	DISTILLA	937.	0	0.12	0.11	0.65
29 DESOA3 DIESEL-SOA HEAT	259.	751.	2281.	390.	823.	241.	259.	-2264.	2540.	DISTILLA	276.	0	0.25	0.32	0.24
29 DESOA3 DIESEL-SOA POWR	259.	90.	274.	47.	99.	29.	663.	0.	937.	RESIDUAL	937.	0	0.12	0.11	0.65
29 DESOA3 DIESEL-SOA HEAT	259.	751.	2281.	390.	823.	241.	259.	-2264.	2540.	RESIDUAL	276.	0	0.25	0.32	0.24

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26214 MW 29.00 PROCESS MILLIONS BTU/HR 610.0 PROCESS TEMP(F) 366. PRODUCT UNBLEACHED-K HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.162

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 259. HOT WATER BTU*10**6* 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2	DIESEL-SOA	POWR	259.	106.	274.	60.	99.	29.	647.	0.	921.	DISTILLA	921.	1	0.14	0.11	0.66
30 DESOA2	DIESEL-SOA	HEAT	259.	686.	1773.	390.	640.	188.	259.	-1691.	2032.	DISTILLA	341.	1	0.28	0.32	0.30
30 DESOA2	DIESEL-SOA	POWR	259.	106.	274.	60.	99.	29.	647.	0.	921.	RESIDUAL	921.	1	0.14	0.11	0.66
30 DESOA2	DIESEL-SOA	HEAT	259.	686.	1773.	390.	640.	188.	259.	-1691.	2032.	RESIDUAL	341.	1	0.28	0.32	0.30
31 DESOA1	DIESEL-SOA	POWR	259.	164.	274.	110.	99.	29.	588.	0.	862.	DISTILLA	862.	1	0.21	0.11	0.71
31 DESOA1	DIESEL-SOA	HEAT	259.	583.	973.	390.	351.	103.	259.	-788.	1231.	DISTILLA	443.	1	0.37	0.29	0.50
31 DESOA1	DIESEL-SOA	POWR	259.	164.	274.	110.	99.	29.	588.	0.	862.	RESIDUAL	862.	1	0.21	0.11	0.71
31 DESOA1	DIESEL-SOA	HEAT	259.	583.	973.	390.	351.	103.	259.	-788.	1231.	RESIDUAL	443.	1	0.37	0.29	0.50
32 GTSOAD	GT-HRSG-10	POWR	259.	154.	339.	156.	99.	29.	534.	0.	873.	DISTILLA	873.	0	0.20	0.11	0.70
32 GTSOAD	GT-HRSG-10	HEAT	259.	385.	847.	390.	247.	72.	259.	-463.	1106.	DISTILLA	642.	0	0.31	0.22	0.55
33 GTRA08	GT-85RE-08	POWR	259.	142.	277.	93.	99.	29.	608.	0.	885.	DISTILLA	885.	0	0.18	0.11	0.69
33 GTRA08	GT-85RE-08	HEAT	259.	593.	1160.	390.	414.	121.	259.	-985.	1419.	DISTILLA	434.	0	0.34	0.29	0.43
34 GTRA12	GT-85RE-12	POWR	259.	145.	276.	96.	99.	29.	605.	0.	881.	DISTILLA	881.	0	0.19	0.11	0.69
34 GTRA12	GT-85RE-12	HEAT	259.	593.	1127.	390.	403.	118.	259.	-951.	1385.	DISTILLA	434.	0	0.34	0.29	0.44
35 GTRA16	GT-85RE-16	POWR	259.	147.	284.	103.	99.	29.	597.	0.	880.	DISTILLA	880.	0	0.19	0.11	0.69
35 GTRA16	GT-85RE-16	HEAT	259.	556.	1076.	390.	376.	110.	259.	-865.	1335.	DISTILLA	471.	0	0.34	0.28	0.46
36 GTR208	GT-60RE-08	POWR	259.	146.	309.	124.	99.	29.	571.	0.	881.	DISTILLA	881.	0	0.19	0.11	0.69
36 GTR208	GT-60RE-08	HEAT	259.	459.	970.	390.	310.	91.	259.	-661.	1229.	DISTILLA	568.	0	0.32	0.25	0.50
37 GTR212	GT-60RE-12	POWR	259.	146.	300.	116.	99.	29.	581.	0.	881.	DISTILLA	881.	0	0.19	0.11	0.69
37 GTR212	GT-60RE-12	HEAT	259.	490.	1009.	390.	333.	98.	259.	-731.	1268.	DISTILLA	537.	0	0.33	0.26	0.48
38 GTR216	GT-60RE-16	POWR	259.	149.	294.	113.	99.	29.	585.	0.	878.	DISTILLA	878.	0	0.19	0.11	0.69
38 GTR216	GT-60RE-16	HEAT	259.	513.	1013.	390.	341.	100.	259.	-757.	1272.	DISTILLA	514.	0	0.34	0.27	0.48
39 GTRW08	GT-85RE-08	POWR	259.	119.	282.	78.	99.	29.	626.	0.	908.	DISTILLA	908.	0	0.16	0.11	0.67
39 GTRW08	GT-85RE-08	HEAT	259.	595.	1406.	390.	494.	145.	259.	-1233.	1665.	DISTILLA	432.	0	0.30	0.30	0.37
40 GTRW12	GT-85RE-12	POWR	259.	128.	272.	77.	99.	29.	627.	0.	899.	DISTILLA	899.	0	0.17	0.11	0.68
40 GTRW12	GT-85RE-12	HEAT	259.	648.	1376.	390.	501.	147.	259.	-1256.	1635.	DISTILLA	379.	0	0.32	0.31	0.37

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26214 MW 29.00 PROCESS MILLIONS BTU/HR 610.0 PROCESS TEMP(F) 366. PRODUCT UNBLEACHED-K HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.162

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 259. HOT WATE. BTU*10**6= 0.

	WASTE FUEL. USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	259.	130.	277.	83.	99.	29.	620.	0.	897.	DISTILLA	897.	0	0.17	0.11	0.68
41 GTRW16 GT-85RE-16 HEAT	259.	609.	1297.	390.	463.	136.	259.	-1138.	1556.	DISTILLA	418.	0	0.32	0.30	0.39
42 GTR308 GT-60RE-08 POWR	259.	110.	319.	102.	99.	29.	597.	0.	916.	DISTILLA	916.	0	0.14	0.11	0.67
42 GTR308 GT-60RE-08 HEAT	259.	421.	1216.	390.	377.	110.	259.	-869.	1475.	DISTILLA	606.	0	0.26	0.26	0.41
43 GTR312 GT-60RE-12 POWR	259.	133.	289.	96.	99.	29.	605.	0.	894.	DISTILLA	894.	0	0.17	0.11	0.68
43 GTR312 GT-60RE-12 HEAT	259.	540.	1177.	390.	402.	118.	259.	-948.	1435.	DISTILLA	487.	0	0.31	0.28	0.42
44 GTR316 GT-60RE-16 POWR	259.	132.	292.	97.	99.	29.	603.	0.	895.	DISTILLA	895.	0	0.17	0.11	0.68
44 GTR316 GT-60RE-16 HEAT	259.	528.	1169.	390.	396.	116.	259.	-929.	1427.	DISTILLA	499.	0	0.31	0.28	0.43
45 FCPADS FUEL-CL-PH POWR	259.	101.	260.	44.	99.	29.	666.	0.	926.	DISTILLA	926.	0	0.13	0.11	0.66
45 FCPADS FUEL-CL-PH HEAT	259.	889.	2294.	390.	872.	255.	259.	-2415.	2553.	DISTILLA	138.	0	0.28	0.34	0.24
46 FCMCDS FUEL-CL-MO POWR	259.	135.	240.	56.	99.	29.	652.	0.	892.	DISTILLA	892.	0	0.18	0.11	0.68
46 FCMCDS FUEL-CL-MO HEAT	259.	940.	1674.	390.	690.	202.	259.	-1846.	1933.	DISTILLA	87.	0	0.36	0.36	0.32

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26216 MW 20.00 PROCESS MILLIONS BTU/HR 307.0 PROCESS TEMP(F) 366. PRODUCT NEUT-SU-SCHE HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.222

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	361.	213.	361.	COAL-FGD	574.	0	0.	0.12	0.53
1	STM141	STM-TURB-1	POWR	0.	96.	479.	339.	68.	20.	-37.	0.	479.	RESIDUAL	479.	0	0.17	0.14	0.64
1	STM141	STM-TURB-1	HEAT	0.	121.	434.	307.	62.	18.	0.	20.	434.	RESIDUAL	454.	0	0.21	0.14	0.68
1	STM141	STM-TURB-1	POWR	0.	96.	479.	339.	68.	20.	-37.	0.	479.	COAL-FGD	479.	0	0.17	0.14	0.64
1	STM141	STM-TURB-1	HEAT	0.	121.	434.	307.	62.	18.	0.	20.	434.	COAL-FGD	454.	0	0.21	0.14	0.68
1	STM141	STM-TURB-1	POWR	0.	96.	479.	339.	68.	20.	-37.	0.	479.	COAL-AFB	479.	0	0.17	0.14	0.64
1	STM141	STM-TURB-1	HEAT	0.	121.	434.	307.	62.	18.	0.	20.	434.	COAL-AFB	454.	0	0.21	0.14	0.68
2	STM088	STM-TURB-8	POWR	0.	-58.	633.	470.	68.	20.	-191.	0.	633.	RESIDUAL	633.	0	-0.10	0.11	0.49
2	STM088	STM-TURB-8	HEAT	0.	87.	414.	307.	45.	13.	0.	74.	414.	RESIDUAL	487.	0	0.15	0.09	0.63
2	STM088	STM-TURB-8	POWR	0.	-58.	633.	470.	68.	20.	-191.	0.	633.	COAL-FGD	633.	0	-0.10	0.11	0.49
2	STM088	STM-TURB-8	HEAT	0.	87.	414.	307.	45.	13.	0.	74.	414.	COAL-FGD	487.	0	0.15	0.09	0.63
2	STM088	STM-TURB-8	POWR	0.	-58.	633.	470.	68.	20.	-191.	0.	633.	COAL-AFB	633.	0	-0.10	0.11	0.49
2	STM088	STM-TURB-8	HEAT	0.	87.	414.	307.	45.	13.	0.	74.	414.	COAL-AFB	487.	0	0.15	0.09	0.63
3	PFBSTM	PFB-STMTB-	POWR	0.	130.	326.	207.	68.	20.	118.	0.	444.	COAL-PFB	444.	0	0.23	0.15	0.69
3	PFBSTM	PFB-STMTB-	HEAT	0.	193.	485.	307.	101.	30.	0.	-103.	485.	COAL-PFB	381.	0	0.29	0.21	0.63
4	TISTMT	TI-STMTB-1	POWR	0.	131.	264.	154.	68.	20.	179.	0.	444.	RESIDUAL	444.	0	0.23	0.15	0.69
4	TISTMT	TI-STMTB-1	HEAT	0.	260.	525.	307.	136.	40.	0.	-211.	525.	RESIDUAL	314.	0	0.33	0.26	0.58
4	TISTMT	TI-STMTB-1	POWR	0.	131.	264.	154.	68.	20.	179.	0.	444.	COAL	444.	0	0.23	0.15	0.69
4	TISTMT	TI-STMTB-1	HEAT	0.	260.	525.	307.	136.	40.	0.	-211.	525.	COAL	314.	0	0.33	0.26	0.58
5	TIHRSG	THERMIONIC	POWR	0.	89.	485.	313.	68.	20.	-7.	0.	485.	RESIDUAL	485.	0	0.16	0.14	0.63
5	TIHRSG	THERMIONIC	HEAT	0.	95.	475.	307.	67.	20.	0.	4.	475.	RESIDUAL	480.	0	0.17	0.14	0.64
5	TIHRSG	THERMIONIC	POWR	0.	89.	485.	313.	68.	20.	-7.	0.	485.	COAL	485.	0	0.16	0.14	0.63
5	TIHRSG	THERMIONIC	HEAT	0.	95.	475.	307.	67.	20.	0.	4.	475.	COAL	480.	0	0.17	0.14	0.64
6	STIRL	STIRLING-1	POWR	0.	94.	271.	129.	68.	20.	209.	0.	480.	DISTILLA	480.	0	0.16	0.14	0.64
6	STIRL	STIRLING-1	HEAT	0.	224.	643.	307.	162.	48.	0.	-293.	643.	DISTILLA	350.	0	0.26	0.25	0.48

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26216 MW 20.00 PROCESS MILLIONS BTU/HR 307.0 PROCESS TEMP(F) 366. PRODUCT NEUT-SU-SCHE HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.222

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	94.	271.	129.	68.	20.	209.	0.	480.	RESIDUAL	480.	0	0.16	0.14	0.64
6	STIRL	STIRLING-1	HEAT	0.	224.	643.	307.	162.	48.	0.	-293.	643.	RESIDUAL	350.	0	0.26	0.25	0.48
6	STIRL	STIRLING-1	POWR	0.	94.	271.	129.	68.	20.	209.	0.	480.	COAL	480.	0	0.16	0.14	0.64
6	STIRL	STIRLING-1	HEAT	0.	224.	643.	307.	162.	48.	0.	-293.	643.	COAL	350.	[illegible]	0.26	0.25	0.48
7	HEGT85	HELIUM-GT-	POWR	0.	30.	213.	25.	68.	20.	332.	0.	544.	COAL-AFB	544.	10	0.05	0.13	0.56
7	HEGT85	HELIUM-GT-	HEAT	0.	369	2597.	307.	834.	244.	0.	-2391.	2597.	COAL-AFB	205.	0	0.12	0.32	0.12
8	HEGT60	HELIUM-GT-	POWR	0.	40.	263.	77.	68.	20.	271.	0.	535.	COAL-AFB	535.	10	0.07	0.13	0.57
8	HEGT60	HELIUM-GT-	HEAT	0.	160.	1056.	307.	274.	80.	0.	-642.	1056.	COAL-AFB	415.	0	0.13	0.26	0.29
9	HEGT00	HELIUM-GT-	POWR	0.	48.	388.	189.	68.	20.	138.	0.	526.	COAL-AFB	526.	10	0.08	0.13	0.58
9	HEGT00	HELIUM-GT-	HEAT	0.	78.	629.	307.	111.	32.	0.	-132.	629.	COAL-AFB	496.	10	0.11	0.18	0.49
10	FCMCCL	FUEL-CL-MO	POWR	0.	114.	224.	106.	68.	20.	236.	0.	461.	COAL	461.	10	0.20	0.15	0.67
10	FCMCCL	FUEL-CL-MO	HEAT	0.	329.	649.	307.	197.	58.	0.	-403.	649.	COAL	246.	10	0.34	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	118.	178.	71.	68.	20.	278.	0.	456.	COAL	456.	10	0.21	0.15	0.67
11	FCSTCL	FUEL-CL-ST	HEAT	0.	514.	775.	307.	297.	87.	0.	-715.	775.	COAL	60.	10	0.40	0.38	0.40
12	IGGTST	INT-GAS-GT	POWR	0.	94.	239.	102.	68.	20.	242.	0.	481.	COAL	481.	10	0.16	0.14	0.64
12	IGGTST	INT-GAS-GT	HEAT	0.	283.	723.	307.	206.	60.	0.	-431.	723.	COAL	292.	10	0.28	0.29	0.42
13	GTSOAR	GT-HRSG-10	POWR	0.	95.	235.	100.	68.	20.	244.	0.	479.	RESIDUAL	479.	0	0.17	0.14	0.64
13	GTSOAR	GT-HRSG-10	HEAT	0.	293.	724.	307.	210.	62.	0.	-443.	724.	RESIDUAL	281.	0	0.29	0.29	0.42
14	GTAC08	GT-HRSG-08	POWR	0.	114.	253.	130.	68.	20.	208.	0.	461.	RESIDUAL	461.	0	0.20	0.15	0.67
14	GTAC08	GT-HRSG-08	HEAT	0.	268.	597.	307.	161.	47.	0.	-290.	597.	RESIDUAL	306.	0	0.31	0.27	0.51
15	GTAC12	GT-HRSG-12	POWR	0.	112.	224.	104.	68.	20.	238.	0.	463.	RESIDUAL	463.	0	C.19	0.15	0.66
15	GTAC12	GT-HRSG-12	HEAT	0.	330.	661.	307.	202.	59.	0.	-417.	681.	RESIDUAL	244.	0	0.33	0.31	0.46
16	GTAC16	GT-HRSG-16	POWR	0.	109.	211.	91.	68.	20.	254.	0.	465.	RESIDUAL	465.	0	0.19	0.15	0.66
16	GTAC16	GT-HRSG-16	HEAT	0.	368.	710.	307.	229.	67.	0.	-503.	710.	RESIDUAL	207.	0	0.34	0.32	0.43
17	GTWC16	GT-HRSG-16	POWR	0.	100.	217.	88.	68.	20.	258.	0.	475.	RESIDUAL	475.	0	0.17	C.14	0.65
17	GTWC16	GT-HRSG-16	HEAT	0.	343.	759.	307.	239.	70.	0.	-534.	759.	RESIDUAL	225.	0	0.32	0.32	0.40

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26216 MW 20.00 PROCESS MILLIONS BTU/HR 307.0 PROCESS TEMP(F) 366. PRODUCT NEUT-SU-SCHE HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.222

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	98.	181.	56.	68.	20.	295.	0.	476.	RESIDUAL	476.	0	0.17	0.14	0.64
18 CC1626 GTST-16/26 HEAT	0.	540.	991.	307.	374.	110.	0.	-956.	991.	RESIDUAL	35.	0	0.35	0.38	0.31
19 CC1622 GTST-16/22 POWR	0.	103.	183.	62.	68.	20.	288.	0.	471.	RESIDUAL	471.	10	0.18	0.14	0.65
19 CC1622 GTST-16/22 HEAT	0.	509.	904.	307.	337.	99.	0.	-839.	904.	RESIDUAL	65.	0	0.36	0.37	0.34
20 CC1222 GTST-12/22 POWR	0.	104.	183.	63.	68.	20.	288.	0.	470.	RESIDUAL	470.	0	0.18	0.15	0.65
20 CC1222 GTST-12/22 HEAT	0.	512.	896.	307.	335.	98.	0.	-833.	896.	RESIDUAL	63.	0	0.36	0.37	0.34
21 CC0822 GTST-08/22 POWR	0.	112.	194.	79.	68.	20.	269.	0.	463.	RESIDUAL	463.	0	0.19	0.15	0.66
21 CC0822 GTST-08/22 HEAT	0.	436.	757.	307.	266.	78.	0.	-619.	757.	RESIDUAL	139.	0	0.37	0.35	0.41
22 STIG15 STIG-15-16 POWR	0.	37.	179.	2.	68.	20.	358.	0.	538.	RESIDUAL	538.	10	0.06	0.13	0.57
22 STIG15 STIG-15-16 HEAT	0.	4863.	23615.	307.	8997.	2637.	0.	-27904.	23615.	RESIDUAL	-4288.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	53.	190.	25.	68.	20.	332.	0.	522.	RESIDUAL	522.	0	0.09	0.13	0.59
23 STIG10 STIG-10-16 HEAT	0.	644.	2317.	307.	832.	244.	0.	-2387.	2317.	RESIDUAL	-70.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	60.	204.	43.	68.	20.	311.	0.	514.	RESIDUAL	514.	0	0.10	0.13	0.60
24 STIG1S STIG-1S-16 HEAT	0.	430.	1456.	307.	488.	143.	0.	-1312.	1456.	RESIDUAL	144.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	74.	184.	38.	68.	20.	317.	0.	501.	RESIDUAL	501.	0	0.13	0.14	0.61
25 DEADV3 DIESEL-ADV HEAT	0.	600.	1498.	307.	556.	163.	0.	-1523.	1498.	RESIDUAL	-25.	0	0.29	0.37	0.20
26 DEADV2 DIESEL-ADV POWR	0.	84.	184.	47.	68.	20.	306.	0.	490.	RESIDUAL	490.	1	0.15	0.14	0.63
26 DEADV2 DIESEL-ADV HEAT	0.	554.	1209.	307.	448.	131.	0.	-1188.	1209.	RESIDUAL	21.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	114.	184.	72.	68.	20.	277.	0.	461.	RESIDUAL	461.	1	0.20	0.15	0.67
27 DEADV1 DIESEL-ADV HEAT	0.	486.	785.	307.	291.	85.	0.	-697.	785.	RESIDUAL	88.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	110.	209.	89.	68.	20.	256.	0.	465.	RESIDUAL	465.	0	0.19	0.15	0.66
28 DEHTPM ADV-DIESEL HEAT	0.	377.	717.	307.	234.	69.	0.	-519.	717.	RESIDUAL	198.	0	0.34	0.33	0.43
29 DESOA3 DIESEL-SOA POWR	0.	62.	189.	32.	68.	20.	323.	0.	512.	DISTILLA	512.	0	0.11	0.13	0.60
29 DESOA3 DIESEL-SOA HEAT	0.	591.	1796.	307.	648.	190.	0.	-1812.	1796.	DISTILLA	-17.	0	0.25	0.36	0.17
29 DESOA3 DIESEL-SOA POWR	0.	62.	189.	32.	68.	20.	323.	0.	512.	RESIDUAL	512.	0	0.11	0.13	0.60
29 DESOA3 DIESEL-SOA HEAT	0.	591.	1796.	307.	648.	190.	0.	-1812.	1796.	RESIDUAL	-17.	0	0.25	0.36	0.17

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26216 MW 20.00 PROCESS MILLIONS BTU/HR 307.0 PROCESS TEMP(F) 366. PRODUCT NEUT-SU-SCHE HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.222

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	73.	189.	42.	68.	20.	312.	0.	501.	DISTILLA	501.	1	0.13	0.14	0.61
30 DESOA2 DIESEL-SOA HEAT	0.	540.	1395.	307.	504.	148.	0.	-1361.	1395.	DISTILLA	34.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	73.	189.	42.	68.	20.	312.	0.	501.	RESIDUAL	501.	1	0.13	0.14	0.61
30 DESOA2 DIESEL-SOA HEAT	0.	540.	1395.	307.	504.	148.	0.	-1361.	1395.	RESIDUAL	34.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	113.	189.	76.	68.	20.	272.	0.	461.	DISTILLA	461.	1	0.20	0.15	0.67
31 DESOA1 DIESEL-SOA HEAT	0.	459.	766.	307.	276.	81.	0.	-650.	766.	DISTILLA	115.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	113.	189.	76.	68.	20.	272.	0.	461.	RESIDUAL	461.	1	0.20	0.15	0.67
31 DESOA1 DIESEL-SOA HEAT	0.	459.	766.	307.	276.	81.	0.	-650.	766.	RESIDUAL	115.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	106.	234.	108.	68.	20.	235.	0.	468.	DISTILLA	468.	0	0.18	0.15	0.66
32 GTSOAD GT-HRSG-10 HEAT	0.	303.	667.	307.	195.	57.	0.	-395.	667.	DISTILLA	272.	0	0.31	0.29	0.46
33 GTRA08 GT-85RE-08 POWR	0.	98.	191.	64.	68.	20.	286.	0.	477.	DISTILLA	477.	0	0.17	0.14	0.64
33 GTRA08 GT-85RE-08 HEAT	0.	467.	913.	307.	326.	96.	0.	-805.	913.	DISTILLA	108.	0	0.34	0.36	0.34
34 GTRA12 GT-85RE-12 POWR	0.	100.	191.	66.	68.	20.	284.	0.	474.	DISTILLA	474.	0	0.17	0.14	0.65
34 GTRA12 GT-85RE-12 HEAT	0.	466.	887.	307.	317.	93.	0.	-779.	887.	DISTILLA	108.	0	0.34	0.36	0.35
35 GTRA16 GT-85RE-16 POWR	0.	101.	196.	71.	68.	20.	278.	0.	473.	DISTILLA	473.	0	0.18	0.14	0.65
35 GTRA16 GT-85RE-16 HEAT	0.	438.	847.	307.	296.	87.	0.	-711.	847.	DISTILLA	136.	0	0.34	0.35	0.36
36 GTR208 GT-60RE-08 POWR	0.	101.	213.	86.	68.	20.	260.	0.	474.	DISTILLA	474.	0	0.18	0.14	0.65
36 GTR208 GT-60RE-08 HEAT	0.	361.	764.	307.	244.	72.	0.	-550.	764	DISTILLA	213.	0	0.32	0.32	0.40
37 GTR212 GT-60RE-12 POWR	0.	10[illegible].	207.	80.	68.	20.	267.	0.	474.	DISTILLA	474.	0	0.17	0.14	0.65
37 GTR212 GT-60RE-12 HEAT	0.	386.	794.	307.	262.	77.	0.	-6[illegible]8.	794.	DISTILLA	188.	0	0.33	0.33	0.39
38 GTR216 GT-60RE-16 POWR	0.	102.	202.	78.	68.	20.	269.	0.	472.	DISTILLA	472.	0	0.18	0.14	0.65
38 GTR216 GT-60RE-16 HEAT	0.	404.	797.	307.	269.	79.	0.	-626.	797.	DISTILLA	171.	0	0.34	0.34	0.39
39 GTRW08 GT-85RE-08 POWR	0.	82.	194.	54.	68.	20.	298.	0.	492.	DISTILLA	492.	0	0.14	0.14	0.62
39 GTRW08 GT-85RE-08 HEAT	0.	468.	1107.	307.	389.	114.	0.	-1001.	1107.	DISTILLA	106.	0	0.30	0.35	0.28
40 GTRW12 GT-85RE-12 POWR	0.	88.	187.	53.	68.	20.	299.	0.	486.	DISTILLA	486.	0	0.15	0.14	0.63
40 GTRW12 GT-85RE-12 HEAT	0.	510.	1083.	307.	394.	116.	0.	-1019.	1083.	DISTILLA	64.	0	0.32	0.36	0.28

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26216 MW 20.00 PROCESS MILLIONS BTU/HR 307.0 PROCESS TEMP(F) 366. PRODUCT NEUT-SU-SCHE HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.222

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	90.	191.	57.	68.	20.	294.	0.	485.	DISTILLA	485.	0	0.16	0.14	0.63
41 GTRW16 GT-85RE-16 HEAT	0.	479.	1021.	307.	365.	107.	0.	-926.	1021.	DISTILLA	95.	0	0.32	0.36	0.30
42 GTR308 GT-60RE-08 POWR	0.	76.	220.	71.	68.	20.	278.	0.	498.	DISTILLA	498.	0	0.13	0.14	0.62
42 GTR308 GT-60RE-08 HEAT	0.	331.	957.	307.	297.	87.	0.	-714.	957.	DISTILLA	243.	0	0.26	0.31	0.32
43 GTR312 GT-60RE-12 POWR	0.	92.	200.	66.	68.	20.	283.	0.	483.	DISTILLA	483.	0	0.16	0.14	0.64
43 GTR312 GT-60RE-12 HEAT	0.	425.	926.	307.	317.	93.	0.	-777.	926.	DISTILLA	150.	0	0.31	0.34	0.33
44 GTR316 GT-60RE-16 POWR	0.	91.	201.	67.	68.	20.	282.	0.	483.	DISTILLA	483.	0	0.16	0.14	0.64
44 GTR316 GT-60RE-16 HEAT	0.	416.	920.	307.	312.	91.	0.	-761.	920.	DISTILLA	159.	0	0.31	0.34	0.33
45 FCPADS FUEL-CL-PH POWR	0.	70.	180.	31.	68.	20.	325.	0.	505.	DISTILLA	505.	0	0.12	0.14	0.61
45 FCPADS FUEL-CL-PH HEAT	0.	700.	1806.	307.	686.	201.	0.	-1931.	1806.	DISTILLA	-125.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	93.	166.	39.	68.	20.	316.	0.	481.	DISTILLA	481.	0	0.16	0.14	0.64
46 FCMCDS FUEL-CL-MO HEAT	0.	740.	1318.	307.	543.	159.	0.	-1483.	1318.	DISTILLA	-166.	0	0.36	0.41	0.23

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26217 MW 31.30 PROCESS MILLIONS BTU/HR 183.0 PROCESS TEMP(F) 366. PRODUCT THERMO-MECH- HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.584

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	215.	334.	215.	COAL-FGD	549.	0	0.	0.19	0.33
1 STM141 STM-TURB-1 POWR	0.	-262.	811.	583.	107.	31.	-470.	0.	811.	RESIDUAL	811.	0	-0.48	0.13	0.23
1 STM141 STM-TURB-1 HEAT	0.	65.	255.	183.	34.	10.	0.	229.	255.	RESIDUAL	484.	0	0.12	0.07	0.38
1 STM141 STM-TURB-1 POWR	0.	-262.	811.	583.	107.	31.	-470.	0.	811.	COAL-FGD	811.	0	-0.48	0.13	0.23
1 STM141 STM-TURB-1 HEAT	0.	65.	255.	183.	34.	10.	0.	229.	255.	COAL-FGD	484.	0	0.12	0.07	0.38
1 STM141 STM-TURB-1 POWR	0.	-262.	811.	583.	107.	31.	-470.	0.	811.	COAL-AFB	811.	0	-0.48	0.13	0.23
1 STM141 STM-TURB-1 HEAT	0.	65.	255.	183.	34.	10.	0.	229.	255.	COAL-AFB	484.	0	0.12	0.07	0.38
2 STM088 STM-TURB-8 POWR	0.	-555.	1104.	832.	107.	31.	-763.	0.	1104.	RESIDUAL	1104.	0	-1.01	0.10	0.17
2 STM088 STM-TURB-8 HEAT	0.	46.	243.	183.	23.	7.	0.	260.	243.	RESIDUAL	503.	0	0.08	0.06	0.36
2 STM088 STM-TURB-8 POWR	0.	-555.	1104.	832.	107.	31.	-763.	0.	1104.	COAL-FGD	1104.	0	-1.01	0.10	0.17
2 STM088 STM-TURB-8 HEAT	0.	46.	243.	183.	23.	7.	0.	260.	243.	COAL-FGD	503.	0	0.08	0.05	0.36
2 STM088 STM-TURB-8 POWR	0.	-555.	1104.	832.	107.	31.	-763.	0.	1104.	COAL-AFB	1104.	0	-1.01	0.10	0.17
2 STM088 STM-TURB-8 HEAT	0.	46.	243.	183.	23.	7.	0.	260.	243.	COAL-AFB	503.	0	0.08	0.06	0.36
3 PFBSTM PFB-STMTB- POWR	0.	14.	535.	344.	107.	31.	-189.	0.	535.	COAL-PFB	535.	0	0.02	0.20	0.34
3 PFBSTM PFB-STMTB- HEAT	0.	108.	285.	183.	57.	17.	0.	156.	285.	COAL-PFB	441.	0	0.20	0.13	0.41
4 TISTMT TI-STMTB-1 POWR	0.	121.	429.	254.	107.	31.	-84.	0.	429.	RESIDUAL	429.	0	0.22	0.25	0.43
4 TISTMT TI-STMTB-1 HEAT	0.	147.	308.	183.	77.	23.	0.	94.	308.	RESIDUAL	402.	0	0.27	0.19	0.46
4 TISTMT TI-STMTB-1 POWR	0.	121.	429.	254.	107.	31.	-84.	0.	429.	COAL	429.	0	0.22	0.25	0.43
4 TISTMT TI-STMTB-1 HEAT	0.	147.	308.	183.	77.	23.	0.	94.	308.	COAL	402.	0	0.27	0.19	0.46
5 TIHRSG THERMIONIC POWR	0.	-210.	759.	490.	107.	31.	-361.	0.	759.	RESIDUAL	759.	0	-0.38	0.14	0.24
5 TIHRSG THERMIONIC HEAT	0.	57.	283.	183.	40.	12.	0.	209.	283.	RESIDUAL	493.	0	0.10	0.08	0.37
5 TIHRSG THERMIONIC POWR	0.	-210.	759.	490.	107.	31.	-361.	0.	759.	COAL	759.	0	-0.38	0.14	0.24
5 TIHRSG THERMIONIC HEAT	0.	57.	283.	183.	40.	12.	0.	209.	283.	COAL	493.	0	0.10	0.08	0.37
6 STIRL STIRLING-1 POWR	0.	125.	424.	202.	107.	31.	-23.	0.	424.	DISTILLA	424.	0	0.23	0.25	0.43
6 STIRL STIRLING-1 HEAT	0.	134.	384.	183.	97.	28.	0.	32.	384.	DISTILLA	415.	0	0.24	0.23	0.44

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26217 MW 31.30 PROCESS MILLIONS BTU/HR 183.0 PROCESS TEMP(F) 366. PRODUCT THERMO-MECH- HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.584

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	125.	424.	202.	107.	31.	-23.	0.	424.	RESIDUAL	424.	0	0.23	0.25	0.43
6 STIRL	STIRLING-1	HEAT	0.	134.	384.	183.	97.	28.	0.	32.	384.	RESIDUAL	415.	0	0.24	0.23	0.44
6 STIRL	STIRLING-1	POWR	0.	125.	424.	202.	107.	31.	-23.	0.	424.	COAL	424.	0	0.23	0.25	0.43
6 STIRL	STIRLING-1	HEAT	0.	134.	384.	183.	97.	28.	0.	32.	384.	COAL	415.	0	0.24	0.23	0.44
7 HEGT85	HELIUM-GT-	POWR	0.	47.	333.	39.	107.	31.	169.	0.	502.	COAL-AFB	502.	10	0.09	0.21	0.36
7 HEGT85	HELIUM-GT-	HEAT	0.	220.	1548.	183.	497.	146.	0.	-1219.	1548.	COAL-AFB	329.	0	0.12	0.32	0.12
8 HEGT60	HELIUM-GT-	POWR	0.	62.	412.	120.	107.	31.	74.	0.	487.	COAL-AFB	487.	10	0.11	0.22	0.38
8 HEGT60	HELIUM-GT-	HEAT	0.	95.	630.	183.	163.	48.	0.	-176.	630.	COAL-AFB	454.	10	0.13	0.26	0.29
9 HEGT00	HELIUM-GT-	POWR	0	-58.	607.	296.	107.	31.	-133.	0.	607.	COAL-AFB	607.	10	-0.11	0.18	0.30
9 HEGT00	HELIUM-GT-	HEAT	0.	47.	375.	183.	66.	19.	0.	128.	375.	COAL-AFB	502.	10	0.09	0.13	0.36
10 FCMCCL	FUEL-CL-MO	POWR	0.	178.	351.	166.	107.	31.	20.	0.	371.	COAL	371.	10	0.32	0.29	0.49
10 FCMCCL	FUEL-CL-MO	HEAT	0.	196.	387.	183.	118.	34.	0.	-34.	387.	COAL	353.	10	0.34	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	184.	283.	114.	107.	31.	81.	0.	365.	COAL	365.	10	0.34	0.29	0.50
11 FCSTCL	FUEL-CL-ST	HEAT	0.	297.	455.	183.	172.	50.	0.	-203.	455.	COAL	252.	10	0.39	0.38	0.40
12 IGGTST	INT-GAS-GT	POWR	0.	145.	383.	165.	107.	31.	21.	0.	404.	COAL	404.	10	0.26	0.26	0.45
12 IGGTST	INT-GAS-GT	HEAT	0.	160.	424.	183.	118.	35.	0.	-36.	424.	COAL	389.	10	0.27	0.28	0.43
13 GTSOAR	GT-HRSG-10	POWR	0.	149.	368.	156.	107.	31.	32.	0.	400.	RESIDUAL	400.	0	0.27	0.27	0.46
13 GTSOAR	GT-HRSG-10	HEAT	0.	175.	432.	183.	125.	37.	0.	-57.	432.	RESIDUAL	374.	0	0.29	0.29	0.42
14 GTAC08	GT-HRSG-08	POWR	0.	153.	396.	204.	107.	31.	-24.	0.	396.	RESIDUAL	396.	0	0.28	0.27	0.46
14 GTAC08	GT-HRSG-08	HEAT	0.	160.	356.	183.	96.	28.	0.	34.	356.	RESIDUAL	389.	0	0.29	0.25	0.47
15 GTAC12	GT-HRSG-12	POWR	0.	175.	350.	163.	107.	31.	24.	0.	374.	RESIDUAL	374.	0	0.32	0.29	0.49
15 GTAC12	GT-HRSG-12	HEAT	0.	197.	394.	183.	120.	35.	0.	-42.	394.	RESIDUAL	352.	0	0.33	0.31	0.46
16 GTAC16	GT-HRSG-16	POWR	0.	171.	331.	143.	107.	31.	47.	0.	378.	RESIDUAL	378.	0	0.31	0.28	0.48
16 GTAC16	GT-HRSG-16	HEAT	0.	219.	423.	183.	137.	40.	0.	-93.	423.	RESIDUAL	330.	0	0.34	0.32	0.43
17 GTWC16	GT-HRSG-16	POWR	0.	156.	339.	137.	107.	31.	54.	0.	393.	RESIDUAL	393.	0	0.28	0.27	0.47
17 GTWC16	GT-HRSG-16	HEAT	0.	208.	452.	183.	142.	42.	0.	-111.	452.	RESIDUAL	341.	0	0.32	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26217 MW 31.30 PROCESS MILLIONS BTU/HR 183.0 PROCESS TEMP(F) 366. PRODUCT THERMO-MECH- HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.584

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	153.	286.	90.	107.	31.	109.	0.	396.	RESIDUAL	396.	0	0.28	0.27	0.46
18 CC1626 GTST-16/26 HEAT	0.	312.	582.	183.	217.	64.	0.	-344.	582.	RESIDUAL	237.	0	0.35	0.37	0.31
19 CC1622 GTST-16/22 POWR	0.	161.	291.	100.	107.	31.	97.	0.	388.	RESIDUAL	388.	0	0.29	0.28	0.47
19 CC1622 GTST-16/22 HEAT	0.	294.	531.	183.	195.	57.	0	-27[illegible].	531.	RESIDUAL	255.	0	0.36	0.37	0.34
20 CC1222 GTST-12/22 POWR	0.	163.	290.	101.	107.	31.	97.	0.	386.	RESIDUAL	386.	0	0.30	0.28	0.47
20 CC1222 GTST-12/22 HEAT	0.	295.	526.	183.	194.	57.	0.	-272.	526.	RESIDUAL	254.	0	0.36	0.37	0.35
21 CC0822 GTST-08/22 POWR	0.	174.	309.	127.	107.	31.	65.	0.	375.	RESIDUAL	375.	0	0.32	0.28	0.49
21 CC0822 GTST-08/22 HEAT	0.	250.	444.	183.	153.	45.	0.	-146.	444.	RESIDUAL	299.	0	0.36	0.35	0.41
22 STIG15 STIG-15-16 POWR	0.	58.	280.	4.	107.	31.	211.	0.	491.	RESIDUAL	491.	0	0.11	0.22	0.37
22 STIG15 STIG-15-16 HEAT	0.	2899.	14077.	183.	5363.	1572.	0.	-16427.	14077.	RESIDUAL	-2350.	0	0.17	0.36	0.01
23 STIG10 STIG-10-16 POWR	0.	83.	297.	39.	107.	31.	169.	0.	466.	RESIDUAL	466.	0	0.15	0.23	0.39
23 STIG10 STIG-10-16 HEAT	0.	384.	1381.	183.	496.	145.	0.	-1216.	1381.	RESIDUAL	165.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	94.	319.	67.	107.	31.	136.	0.	455.	RESIDUAL	455.	0	0.17	0.23	0.40
24 STIG1S STIG-1S-16 HEAT	0.	257.	868.	183.	291.	85.	0.	-576.	868.	RESIDUAL	293.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	115.	288.	59.	107.	31.	146.	0.	434.	RESIDUAL	434.	0	0.21	0.25	0.42
25 DEADV3 DIESEL-ADV HEAT	0.	358.	893.	183.	331.	97.	0.	-701.	893.	RESIDUAL	191.	0	0.29	0.37	0.20
26 DEADV2 DIESEL-ADV POWR	0.	132.	288.	73.	107.	31.	129.	0.	417.	RESIDUAL	417.	1	0.24	0.28	0.44
26 DEADV2 DIESEL-ADV HEAT	0.	330.	720.	183.	267.	78.	0.	-502.	720.	RESIDUAL	219.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	178.	288.	113.	107.	31.	83.	0.	371.	RESIDUAL	371.	1	0.32	0.29	0.49
27 DEADV1 DIESEL-ADV HEAT	0.	290.	468.	183.	174.	51.	0.	-209.	468.	RESIDUAL	259.	1	0.38	0.[illegible]7	0.39
28 DEHTPM ADV-DIESEL POWR	0.	172.	327.	140.	107.	31.	51.	0.	377.	RESIDUAL	377.	0	0.31	0.28	0.49
28 DEHTPM ADV-DIESEL HEAT	0.	225.	427.	183.	140.	41.	0.	-103.	427.	RESIDUAL	324.	0	0.34	0.33	0.43
29 DESOA3 DIESEL-SOA POWR	0.	97.	296.	51.	107.	31.	156.	0.	452.	DISTILLA	452.	0	0.18	0.24	0.41
29 DESOA3 DIESEL-SOA HEAT	0.	352.	1070.	183.	386.	113.	0.	-874.	1070.	DISTILLA	197.	0	0.25	0.36	0.17
29 DESOA3 DIESEL-SOA POWR	0.	97.	296.	51.	107.	31.	156.	0.	452.	RESIDUAL	452.	0	0.18	0.24	0.41
29 DESOA3 DIESEL-SOA HEAT	0.	352.	1070.	183.	386.	113.	0.	-874.	1070.	RESIDUAL	197.	0	0.25	0.36	0.17

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26217 MW 31.30 PROCESS MILLIONS BTU/HR 183.0 PROCESS TEMP(F) 366. PRODUCT THERMO-MECH- HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.584

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	114.	296.	65.	107.	31.	139.	0.	435.	DISTILLA	435.	1	0.21	0.25	0.42
30	DESOA2	DIESEL-SOA	HEAT	0.	322.	832.	183.	300.	88.	0.	-605.	832.	DISTILLA	227.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	114.	296.	65.	107.	31.	139.	0.	435.	RESIDUAL	435.	1	0.21	0.25	0.42
30	DESOA2	DIESEL-SOA	HEAT	0.	322.	832.	183.	300.	88.	0.	-605.	832.	RESIDUAL	227.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	177.	296.	119.	107.	31.	76.	0.	372.	DISTILLA	372.	1	0.32	0.29	0.49
31	DESOA1	DIESEL-SOA	HEAT	0.	274.	456.	183.	165.	48.	0.	-181.	456.	DISTILLA	275.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	177.	296.	119.	107.	31.	76.	0.	372.	RESIDUAL	372.	1	0.32	0.29	0.49
31	DESOA1	DIESEL-SOA	HEAT	0.	274.	456.	183.	165.	48.	0.	-181.	456.	RESIDUAL	275.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	166.	366.	168	107.	31.	17.	0.	383.	DISTILLA	383.	0	0.30	0.28	0.48
32	GTSOAD	GT-HRSG-10	HEAT	0.	181.	397.	183.	116.	34.	0.	-29.	397.	DISTILLA	369.	0	0.31	0.29	0.43
33	GTRA08	GT-85RE-08	POWR	0.	153.	299.	101.	107.	31.	97.	0.	396.	DISTILLA	396.	0	0.28	0.27	0.46
33	GTRA08	GT-85RE-08	HEAT	0.	278.	544.	183.	194.	57.	0.	-273.	544.	DISTILLA	271.	0	0.34	0.36	0.34
34	GTRA12	GT-85RE-12	POWR	0.	157.	298.	103.	107.	31.	94.	0.	392.	DISTILLA	392.	0	0.29	0.27	0.47
34	GTRA12	GT-85RE-12	HEAT	0.	278.	529.	183.	189.	55.	0.	-258.	529.	DISTILLA	271.	0	0.34	0.36	0.35
35	GTRA16	GT-85RE-16	POWR	0.	158.	306.	111.	107.	31.	85.	0.	391.	DISTILLA	391.	0	0.29	0.27	0.47
35	GTRA16	GT-85RE-16	HEAT	0.	261.	505.	183.	176.	52.	0.	-217.	505.	DISTILLA	288.	0	0.34	0.33	0.36
36	GTR208	GT-60RE-08	POWR	0.	158.	334.	134.	107.	31.	57.	0.	391.	DISTILLA	391.	0	0.29	0.27	0.47
36	GTR208	GT-60RE-08	HEAT	0.	215.	455.	183.	146.	43.	0.	-121.	455.	DISTILLA	334.	0	0.32	0.32	0.40
37	GTR212	GT-60RE-12	POWR	0.	157.	324.	125.	107.	31.	68.	0.	392.	DISTILLA	392.	0	0.29	0.27	0.47
37	GTR212	GT-60RE-12	HEAT	0.	230.	473.	183.	156.	46.	0.	-154.	473.	DISTILLA	319.	0	0.33	0.33	0.39
38	GTR216	GT-60RE-16	POWR	0.	160.	317.	122.	107.	31.	72.	0.	389.	DISTILLA	389.	0	0.29	0.27	0.47
38	GTR216	GT-60RE-16	HEAT	0.	241.	475.	183.	160.	47.	0.	-167.	475.	DISTILLA	308.	0	0.34	0.34	0.39
39	GTRW08	GT-85RE-08	POWR	0.	129.	304.	84.	107.	31.	116.	0.	420.	DISTILLA	420.	0	0.23	0.25	0.44
39	GTRW08	GT-85RE-08	HEAT	0.	279.	660.	183.	232.	68.	0.	-390.	660.	DISTILLA	270.	0	0.30	0.35	0.28
40	GTRW12	GT-85RE-12	POWR	0.	138.	293.	83.	107.	31.	117.	0.	411.	DISTILLA	411.	0	0.25	0.26	0.45
40	GTRW12	GT-85RE-12	HEAT	0.	304.	646.	183.	235.	69.	0.	-401.	646.	DISTILLA	245.	0	0.32	0.36	0.28

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26217 MW 31.30 PROCESS MILLIONS BTU/HR 183.0 PROCESS TEMP(F) 366. PRODUCT THERMO-MECH- HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.584

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	140.	299.	90.	107.	31.	110.	0.	409.	DISTILLA	409.	0	0.26	0.26	0.45
41 GTRW16 GT-85RE-16 HEAT	0.	286.	609.	183.	217.	64.	0.	-345.	609.	DISTILLA	263.	0	0.32	0.36	0.30
42 GTR308 GT-60RE-08 POWR	0.	119.	345.	111.	107.	31.	85.	0.	430.	DISTILLA	430.	0	0.22	0.25	0.43
42 GTR308 GT-60RE-08 HEAT	0.	197.	570.	183.	177.	52.	0.	-219.	570.	DISTILLA	352.	0	0.26	0.31	0.32
43 GTR312 GT-60RE-12 POWR	0.	143.	312.	103.	107.	31.	94.	0.	406.	DISTILLA	406.	0	0.26	0.26	0.45
43 GTR312 GT-60RE-12 HEAT	0.	253.	552.	183.	189.	55.	0.	-256.	552.	DISTILLA	296.	0	0.31	0.34	0.33
44 GTR316 GT-60RE-16 POWR	0.	142.	315.	105.	107.	31.	92.	0.	407.	DISTILLA	407.	0	0.26	0.26	0.45
44 GTR316 GT-60RE-16 HEAT	0.	248.	548.	183.	186.	54.	0.	-247.	548.	DISTILLA	301.	0	0.31	0.34	0.33
45 FCPADS FUEL-CL-PH POWR	0.	109.	281.	48.	107.	31.	159.	0.	440.	DISTILLA	440.	0	0.20	0.24	0.42
45 FCPADS FUEL-CL-PH HEAT	0.	417.	1076.	183.	409.	120.	0.	-945.	1076.	DISTILLA	132.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	146.	259.	60.	107.	31.	144.	0.	403.	DISTILLA	403.	0	0.27	0.26	0.45
46 FCMCDS FUEL-CL-MO HEAT	0.	441.	785.	183.	324.	95.	0.	-677.	785.	DISTILLA	108.	0	0.36	0.41	0.23

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26218 MW 15.00 PROCESS MILLIONS BTU/HR 244.0 PROCESS TEMP(F) 366. PRODUCT WASTE-PAPER HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.210

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	287.	160.	287.	COAL-FGD	447.	0	0.	0.11	0.55
1 STM141	STM-TURB-1	POWR	0.	73.	374.	267.	51.	15.	-27.	0.	374.	RESIDUAL	374.	0	0.16	0.14	0.65
1 STM141	STM-TURB-1	HEAT	0.	91.	342.	244.	47.	14.	0.	14.	342.	RESIDUAL	356.	0	0.20	0.13	0.69
1 STM141	STM-TURB-1	POWR	0.	73.	374.	267.	51.	15.	-27.	0.	374.	COAL-FGD	374.	0	0.16	0.14	0.65
1 STM141	STM-TURB-1	HEAT	0.	91.	342.	244.	47.	14.	0.	14.	342.	COAL-FGD	356.	0	0.20	0.13	0.69
1 STM141	STM-TURB-1	POWR	0.	73.	374.	267.	51.	15.	-27.	0.	374.	COAL-AFB	374.	0	0.16	0.14	0.65
1 STM141	STM-TURB-1	HEAT	0.	91.	342.	244.	47.	14.	0.	14.	342.	COAL-AFB	356.	0	0.20	0.13	0.69
2 STM088	STM-TURB-8	POWR	0.	-55.	502.	375.	51.	15	-155	0.	502.	RESIDUAL	502.	0	-0.12	0.10	0.49
2 STM088	STM-TURB-8	HEAT	0.	65.	326.	244.	33.	10.	0.	56.	326.	RESIDUAL	382.	0	0.15	0.09	0.64
2 STM088	STM-TURB-8	POWR	0.	-55.	502.	375.	51.	15.	-155.	0.	502.	COAL-FGD	502.	0	-0.12	0.10	0.49
2 STM088	STM-TURB-8	HEAT	0.	65.	326.	244.	33.	10.	0.	56.	326.	COAL-FGD	382.	0	0.15	0.09	0.64
2 STM088	STM-TURB-8	POWR	0.	-55.	502.	375.	51.	15.	-155.	0.	502.	COAL-AFB	502.	0	-0.12	0.10	0.49
2 STM088	STM-TURB-8	HEAT	0.	65.	326.	244.	33.	10.	0.	56.	326.	COAL-AFB	382.	0	0.15	0.09	0.64
3 PFBSTM	PFB-STMTB-	POWR	0.	97.	251.	160.	51.	15.	99.	0.	350.	COAL-PFB	350.	0	0.22	0.15	0.70
3 PFBSTM	PFB-STMTB-	HEAT	0.	148.	382.	244.	78.	23.	0.	-84.	382.	COAL-PFB	299.	0	0.28	0.20	0.64
4 TISTMT	TI-STMTB-1	POWR	0.	98.	202.	119.	51.	15.	147.	0.	349.	RESIDUAL	349.	0	0.22	0.15	0.70
4 TISTMT	TI-STMTB-1	HEAT	0.	201.	414.	244.	105.	31.	0.	-168.	414.	RESIDUAL	246.	0	0.33	0.25	0.59
4 TISTMT	TI-STMTB-1	POWR	0.	98.	202.	119.	51.	15.	147.	0.	349.	COAL	349.	0	0.22	0.15	0.70
4 TISTMT	TI-STMTB-1	HEAT	0.	201.	414.	244.	105.	31.	0.	-168.	414.	COAL	246.	0	0.33	0.25	0.59
5 TIHRSG	THERMIONIC	POWR	0.	73.	364.	235.	51.	15.	11.	0.	374.	RESIDUAL	374.	0	0.16	0.14	0.65
5 TIHRSG	THERMIONIC	HEAT	0.	75.	378.	244.	53.	16.	0.	-6.	378.	RESIDUAL	372.	0	0.17	0.14	0.65
5 TIHRSG	THERMIONIC	POWR	0.	73.	364.	235.	51.	15.	11.	0.	374.	COAL	374.	0	0.16	0.14	0.65
5 TIHRSG	THERMIONIC	HEAT	0.	75.	378.	244.	53.	16.	0.	-6.	378.	COAL	372.	0	0.17	0.14	0.65
6 STIRL	STIRLING-1	POWR	0.	71.	203.	97.	51.	15.	173.	0.	376.	DISTILLA	376.	0	0.16	0.14	0.65
6 STIRL	STIRLING-1	HEAT	0.	178.	511.	244.	129.	38.	0.	-243.	511.	DISTILLA	269.	0	0.26	0.25	0.48

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26218 MW 15.00 PROCESS MILLIONS BTU/HR 244.0 PROCESS TEMP(F) 366. PRODUCT WASTE-PAPER HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.210

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	71.	203.	97.	51.	15.	173.	0.	376.	RESIDUAL	376.	0	0.16	0.14	0.65
6 STIRL	STIRLING-1	HEAT	0.	178.	511.	244.	129.	38.	0.	-243.	511.	RESIDUAL	269.	0	0.26	0.25	0.48
6 STIRL	STIRLING-1	POWR	0.	71.	203.	97.	51.	15.	173.	0.	376.	COAL	376.	0	0.16	0.14	0.65
6 STIRL	STIRLING-1	HEAT	0.	178.	511.	244.	129.	38.	0.	-243.	511.	COAL	269.	0	0.26	0.25	0.48
7 HEGT85	HELIUM-GT-	POWR	0.	23.	159.	19.	51.	15.	265.	0.	424.	COAL-AFB	424.	10	0.05	0.12	0.58
7 HEGT85	HELIUM-GT-	HEAT	0.	294.	2064.	244.	662.	194.	0.	-1910.	2064.	COAL-AFB	153.	0	0.42	0.32	0.12
8 HEGT60	HELIUM-GT-	POWR	0.	30.	198.	57.	51.	15.	219.	0.	417.	COAL-AFB	417.	10	0.07	0.12	0.58
8 HEGT60	HELIUM-GT-	HEAT	0.	127.	840.	244.	217.	64.	0.	-520.	840.	COAL-AFB	320.	0	0.13	0.26	0.29
9 HEGT00	HELIUM-GT-	POWR	0.	36.	291.	142.	51.	15.	120.	0.	411.	COAL-AFB	411.	10	0.08	0.12	0.59
9 HEGT00	HELIUM-GT-	HEAT	0.	62.	500.	244.	88.	26.	0.	-115.	500.	COAL-AFB	385.	10	0.11	0.18	0.49
10 FCMCCL	FUEL-CL-MO	POWR	0.	85.	168.	80.	51.	15.	193.	0.	362.	COAL	362.	10	0.19	0.14	0.67
10 FCMCCL	FUEL-CL-MO	HEAT	0.	261.	515.	244.	157.	46.	0.	-330.	515.	COAL	186.	10	0.34	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	88.	135.	54.	51.	15.	224.	0.	359.	COAL	359.	10	0.20	0.14	0.68
11 FCSTCL	FUEL-CL-ST	HEAT	0.	402.	611.	244.	232.	68.	0.	-566.	611.	COAL	45.	10	0.40	0.38	0.40
12 IGGTST	INT-GAS-GT	POWR	0.	70.	182.	78.	51.	15.	196.	0.	377.	COAL	377.	10	0.16	0.14	0.65
12 IGGTST	INT-GAS-GT	HEAT	0.	219.	570.	244.	161.	47.	0.	-342.	570.	COAL	228.	10	0.28	0.28	0.43
13 GTSOAR	GT-HRSG-10	POWR	0.	71.	176.	75.	51.	15.	199.	0.	375.	RESIDUAL	375.	0	0.16	0.14	0.65
13 GTSOAR	GT-HRSG-10	HEAT	0.	233.	575.	244.	167.	49.	0.	-362.	575.	RESIDUAL	214.	0	0.29	0.29	0.42
14 GTAC08	GT-HRSG-08	POWR	0.	85.	190.	98.	51.	15.	172.	0.	362.	RESIDUAL	362.	0	0.19	0.14	0.67
14 GTAC08	GT-HRSG-08	HEAT	0.	213.	474.	244.	128.	38.	0.	-240.	474.	RESIDUAL	234.	0	0.31	0.27	0.51
15 GTAC12	GT-HRSG-12	POWR	0.	84.	168.	78.	51.	15.	195.	0.	363.	RESIDUAL	363.	0	0.19	0.14	0.67
15 GTAC12	GT-HRSG-12	HEAT	0.	262.	526.	244.	160.	47.	0.	-341.	526.	RESIDUAL	185.	0	0.33	0.31	0.46
16 GTAC16	GT-HRSG-16	POWR	0.	82.	158.	69.	51.	15.	206.	0.	365.	RESIDUAL	365.	0	0.18	0.14	0.67
16 GTAC16	GT-HRSG-16	HEAT	0.	292.	564.	244.	182.	53.	0.	-410.	564.	RESIDUAL	155.	0	0.34	0.32	0.43
17 GTWC16	GT-HRSG-16	POWR	0.	75.	162.	66.	51.	15.	210.	0.	372.	RESIDUAL	372.	10	0.17	0.14	0.66
17 GTWC16	GT-HRSG-16	HEAT	0.	278.	603.	244.	190.	56.	0.	-434.	603.	RESIDUAL	169.	0	0.32	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26218 MW 15.00 PROCESS MILLIONS BTU/HR 244.0 PROCESS TEMP(F) 366. PRODUCT WASTE-PAPER HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.210

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	74.	136.	43.	51.	15.	237.	0.	373.	RESIDUAL	373.	10	0.16	0.14	0.65
18 CC1626 GTST-16/26 HEAT	0.	422.	781.	244.	293.	86.	0.	-756.	781.	RESIDUAL	25.	0	0.35	0.38	0.31
19 CC1622 GTST-16/22 POWR	0.	77.	138.	47.	51.	15.	231.	0.	370.	RESIDUAL	370.	10	0.17	0.14	0.66
19 CC1622 GTST-16/22 HEAT	0.	398.	712.	244.	263.	77.	0.	-663.	712.	RESIDUAL	49.	0	0.36	0.37	0.34
20 CC1222 GTST-12/22 POWR	0.	78.	138.	48.	51.	15.	231.	0.	369.	RESIDUAL	369.	0	0.17	0.14	0.66
20 CC1222 GTST-12/22 HEAT	0.	400.	706.	244.	262.	77.	0.	-659.	706.	RESIDUAL	47.	0	0.36	0.37	0.35
21 CC0822 GTST-08/22 POWR	0.	84.	147.	60.	51.	15.	216.	0.	363.	RESIDUAL	363.	0	0.19	0.14	0.67
21 CC0822 GTST-08/22 HEAT	0.	340.	597.	244.	208.	61.	0.	-490.	597.	RESIDUAL	107.	0	0.36	0.35	0.41
22 STIG15 STIG-15-16 POWR	0.	28.	134.	2.	51.	15.	285.	0.	419.	RESIDUAL	419.	10	0.06	0.12	0.58
22 STIG15 STIG-15-16 HEAT	0.	3865.	18769.	244.	7151.	2096.	0.	-22187.	18769.	RESIDUAL	-3418.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	40.	143.	19.	51.	15.	265.	0.	407.	RESIDUAL	407.	10	0.09	0.13	0.60
23 STIG10 STIG-10-16 HEAT	0.	512.	1842.	244.	661.	194.	0.	-1907.	1842.	RESIDUAL	-65.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	45.	153.	32.	51	15.	249.	0.	402.	RESIDUAL	402.	10	0.10	0.13	0.61
24 STIG1S STIG-1S-16 HEAT	0.	342.	1157.	244.	388.	114.	0.	-1053.	1157.	RESIDUAL	105.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	55.	138.	28.	51.	15.	254.	0.	392.	RESIDUAL	392.	0	0.12	0.13	0.62
25 DEADV3 DIESEL-ADV HEAT	0.	477.	1190.	244.	442.	129.	0.	-1220.	1190.	RESIDUAL	-30.	0	0.29	0.37	0.20
26 DEADV2 DIESEL-ADV POWR	0.	63.	138.	35.	51.	15.	246.	0.	384.	RESIDUAL	384.	1	0.14	0.13	0.64
26 DEADV2 DIESEL-ADV HEAT	0.	440.	961.	244.	356.	104.	0.	-954.	961.	RESIDUAL	7.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	85.	138.	54.	51.	15.	224.	0.	362.	RESIDUAL	362.	1	0.19	0.14	0.67
27 DEADV1 DIESEL-ADV HEAT	0.	387.	624.	244.	232.	68.	0.	-564.	624.	RESIDUAL	60.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	82.	157.	67.	51.	15.	208.	0.	365.	RESIDUAL	365.	0	0.18	0.14	0.67
28 DEHTPM ADV-DIESEL HEAT	0.	300.	569.	244.	186.	55.	0.	-422.	569.	RESIDUAL	147.	0	0.34	0.33	0.43
29 DESOA3 DIESEL-SOA POWR	0.	47.	142.	24.	51.	15.	259.	0.	400.	DISTILLA	400.	0	0.10	0.13	0.61
29 DESOA3 DIESEL-SOA HEAT	0.	470.	1427.	244.	515.	151.	0.	-1450.	1427.	DISTILLA	-23.	0	0.25	0.36	0.17
29 DESOA3 DIESEL-SOA POWR	0.	47.	142.	24.	51.	15.	259.	0.	400.	RESIDUAL	400.	0	0.10	0.13	0.61
29 DESOA3 DIESEL-SOA HEAT	0.	470.	1427.	244.	515.	151.	0.	-1450.	1427.	RESIDUAL	-23.	0	0.25	0.36	0.17

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26218 MW 15.00 PROCESS MILLIONS BTU/HR 244.0 PROCESS TEMP(F) 366. PRODUCT WASTE-PAPER HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.210

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	55.	142.	31.	51.	15.	250.	0.	392.	DISTILLA	392.	1	0.12	0.13	0.62
30 DESOA2 DIESEL-SOA HEAT	0.	429.	1109.	244.	400.	117.	0.	-1091.	1109.	DISTILLA	18.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	55.	142.	31.	51.	15.	250.	0.	392.	RESIDUAL	392.	1	0.12	0.13	0.62
30 DESOA2 DIESEL-SOA HEAT	0.	429.	1109.	244.	400.	117.	0.	-1091.	1109.	RESIDUAL	18.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	85.	142.	57.	51.	15.	220.	0.	362.	DISTILLA	362.	1	0.19	0.14	0.67
31 DESOA1 DIESEL-SOA HEAT	0.	365.	608.	244.	220.	64.	0.	-527.	608.	DISTILLA	82.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	85.	142.	57.	51.	15.	220.	0.	362.	RESIDUAL	362.	1	0.19	0.14	0.67
31 DESOA1 DIESEL-SOA HEAT	0.	365.	608.	244.	220.	64.	0.	-527.	608.	RESIDUAL	82.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	80.	175.	81.	51.	15.	192.	0.	367.	DISTILLA	367.	0	0.18	0.14	0.66
32 GTSOAD GT-HRSG-10 HEAT	0.	241.	530.	244.	155.	45.	0.	-323.	530.	DISTILLA	208.	0	0.31	0.29	0.46
33 GTRA08 GT-85RE-08 POWR	0.	73.	143.	48.	51.	15.	230.	0.	374.	DISTILLA	374.	0	0.16	0.14	0.65
33 GTRA08 GT-85RE-08 HEAT	0.	371.	726.	244.	259.	76.	0.	-650.	726.	DISTILLA	76.	0	0.34	0.36	0.34
34 GTRA12 GT-85RE-12 POWR	0.	75.	143.	49.	51.	15.	229.	0.	372.	DISTILLA	372.	0	0.17	0.14	0.66
34 GTRA12 GT-85RE-12 HEAT	0.	371.	705.	244.	252.	74.	0.	-629.	705.	DISTILLA	76.	0	0.34	0.36	0.35
35 GTRA16 GT-85RE-16 POWR	0.	76.	147.	53.	51.	15.	225.	0.	371.	DISTILLA	371.	0	0.17	0.14	0.66
35 GTRA16 GT-85RE-16 HEAT	0.	348.	673.	244.	235.	69.	0.	-574.	673.	DISTILLA	99.	0	0.34	0.35	0.36
36 GTR208 GT-60RE-08 POWR	0.	76.	160.	64.	51.	15.	211.	0.	371.	DISTILLA	371.	0	0.17	0.14	0.66
36 GTR208 GT-60RE-08 HEAT	0.	287.	607.	244.	194.	57.	0.	-447.	607.	DISTILLA	160.	0	0.32	0.32	0.40
37 GTR212 GT-60RE-12 POWR	0.	75.	155.	60.	51.	15.	217.	0.	372.	DISTILLA	372.	0	0.17	0.14	0.66
37 GTR212 GT-60RE-12 HEAT	0.	307.	631.	244.	208.	61.	0.	-491.	631.	DISTILLA	140.	0	0.33	0.33	0.39
38 GTR216 GT-60RE-16 POWR	0.	77.	152.	58.	51.	15.	218.	0.	370.	DISTILLA	370.	0	0.17	0.14	0.66
38 GTR216 GT-60RE-16 HEAT	0.	321.	634.	244.	214.	63.	0.	-507.	634.	DISTILLA	126.	0	0.34	0.34	0.39
39 GTRW08 GT-85RE-08 POWR	0.	62.	146.	40.	51.	15.	239.	0.	385.	DISTILLA	385.	10	0.14	0.13	0.63
39 GTRW08 GT-85RE-08 HEAT	0.	372.	880.	244.	309.	90.	0.	-805.	880.	DISTILLA	75.	0	0.30	0.35	0.28
40 GTRW12 GT-85RE-12 POWR	0.	66.	141.	40.	51.	15.	240.	0.	381.	DISTILLA	381.	10	0.15	0.13	0.64
40 GTRW12 GT-85RE-12 HEAT	0.	405.	861.	244.	313.	92.	0.	-819.	861.	DISTILLA	42.	0	0.32	0.36	0.28

HONEYWELL PAGE PRINTING SYSTEM- P1185-02

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26218 MW 15.00 PROCESS MILLIONS BTU/HR 244.0 PROCESS TEMP(F) 366. PRODUCT WASTE-PAPER HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.210

UTILITY FUEL COAL WASTE FUEL EQV BTU×10××6= 0. HOT WATER BTU×10××6= 0.

	WASTE FUEL USED 10××6 BTU/HR	FUEL SAVED= NO-NET 10××6 BTU/HR	COGEN FUEL USED 10××6 BTU/HR	COGEN PROCES HEAT 10××6 BTU/HR	COGEN PROCES POWER 10××6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10××6 BTU/HR	UTILIT FUEL USED 10××6 BTU/HR	TOTAL FUEL SITE 10××6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10××6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	67.	143.	43.	51.	15.	236.	0.	380.	DISTILLA	380.	10	0.15	0.13	0.64
41 GTRW16 GT-85RE-16 HEAT	0.	381.	812.	244.	290.	85.	0.	-746.	812.	DISTILLA	66.	0	0.32	0.36	0.30
42 GTR308 GT-60RE-08 POWR	0.	57.	165.	53.	51.	15.	225.	0.	390.	DISTILLA	390.	10	0.13	0.13	0.63
42 GTR308 GT-60RE-08 HEAT	0.	263.	761.	244.	236.	69.	0.	-577.	761.	DISTILLA	184.	0	0.26	0.31	0.32
43 GTR312 GT-60RE-12 POWR	0.	69.	150.	50.	51.	15.	229.	0.	378.	DISTILLA	378.	10	0.15	0.14	0.64
43 GTR312 GT-60RE-12 HEAT	0.	338.	736.	244.	252.	74.	0.	-627.	736.	DISTILLA	109.	0	0.31	0.34	0.33
44 GTR316 GT-60RE-16 POWR	0.	68.	151.	50.	51.	15.	228.	0.	379.	DISTILLA	379.	10	0.15	0.14	0.64
44 GTR316 GT-60RE-16 HEAT	0.	330.	731.	244.	248.	73.	0.	-615.	731.	DISTILLA	117.	0	0.31	0.34	0.33
45 FCPADS FUEL-CL-PH POWR	0.	52.	135.	23.	51.	15.	260.	0.	395.	DISTILLA	395.	0	0.12	0.13	0.62
45 FCPADS FUEL-CL-PH HEAT	0.	556.	1435.	244.	545.	160.	0.	-1544.	1435.	DISTILLA	-109.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	70.	124.	29.	51.	15.	253.	0.	377.	DISTILLA	377.	0	0.16	0.14	0.65
46 FCMCDS FUEL-CL-MO HEAT	0.	588.	1047.	244.	431.	126.	0.	-1188.	1047.	DISTILLA	-141.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

REPORT 5.1

I&SE PEO ADV DESIGN ENGR

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28001 MW 32.50 PROCESS MILLIONS BTU/HR 1100.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.101

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0	0.	0.	0.	0.	1294.	347.	1294.	COAL-FGD	1641.	0	0.	0.07	0.67
1 STM141 STM-TURB-1 POWR	0.	216.	850.	611.	111.	33.	575.	0.	1425.	RESIDUAL	1425.	0	0.13	0.08	0.77
1 STM141 STM-TURB-1 HEAT	0.	389.	1529.	1100.	200.	58.	0.	-277.	1529.	RESIDUAL	1252.	0	0.20	0.13	0.72
1 STM141 STM-TURB-1 POWR	0.	216.	850.	611.	111.	33.	575.	0.	1425.	COAL-FGD	1425.	0	0.13	0.08	0.77
1 STM141 STM-TURB-1 HEAT	0.	389.	1529.	1100.	200.	58.	0.	-277.	1529.	COAL-FGD	1252.	0	0.20	0.13	0.72
1 STM141 STM-TURB-1 POWR	0.	216.	850.	611.	111.	33.	575.	0.	1425.	COAL-AFB	1425.	0	0.13	0.08	0.77
1 STM141 STM-TURB-1 HEAT	0.	389.	1529.	1100.	200.	58.	0.	-277.	1529.	COAL-AFB	1252.	0	0.20	0.13	0.72
2 STM088 STM-TURB-8 POWR	0.	216.	1161.	876.	111.	33.	264.	0.	1425.	RESIDUAL	1425.	0	0.13	0.08	0.77
2 STM088 STM-TURB-8 HEAT	0.	271.	1458.	1100.	139.	41.	0.	-89.	1458.	RESIDUAL	1369.	0	0.16	0.10	0.75
2 STM088 STM-TURB-8 POWR	0.	216.	1161.	876.	111.	33.	264.	0.	1425.	COAL-FGD	1425.	0	0.13	0.08	0.77
2 STM088 STM-TURB-8 HEAT	0.	271.	1458.	1100.	139.	41.	0.	-89.	1458.	COAL-FGD	1369.	0	0.16	0.10	0.75
2 STM088 STM-TURB-8 POWR	0.	216.	1161.	876.	111.	33.	264.	0.	1425.	COAL-AFB	1425.	0	0.13	0.08	0.77
2 STM088 STM-TURB-8 HEAT	0.	271.	1458.	1100.	139.	41.	0.	-89.	1458.	COAL-AFB	1369.	0	0.16	0.10	0.75
3 PFBSTM PFB-STMTB- POWR	0.	211.	559.	359.	111.	33.	871.	0.	1430.	COAL-PFB	1430.	0	0.13	0.08	0.77
3 PFBSTM PFB-STMTB- HEAT	0.	645.	1710.	1100.	339.	99.	0.	-714.	1710.	COAL-PFB	996.	0	0.27	0.20	0.64
4 TISTMT TI-STMTB-1 POWR	0.	212.	447.	266.	111.	33.	982.	0.	1428.	RESIDUAL	1428.	0	0.13	0.08	0.77
4 TISTMT TI-STMTB-1 HEAT	0.	879.	1850.	1100	459.	135.	0.	-1088.	1850.	RESIDUAL	761.	0	0.32	0.25	0.59
4 TISTMT TI-STMTB-1 POWR	0.	212.	447.	266.	111.	33.	982.	0.	1428.	COAL	1428.	0	0.13	0.08	0.77
4 TISTMT TI-STMTB-1 HEAT	0.	879.	1850.	1100.	459.	135.	0.	-1088.	1850.	COAL	761.	0	0.32	0.25	0.59
5 TIHRSG THERMIONIC POWR	0.	157.	788.	509.	111.	33.	695.	0.	1483.	RESIDUAL	1483.	0	0.10	0.07	0.74
5 TIHRSG THERMIONIC HEAT	0.	340.	1703.	1100.	240.	70.	0.	-402.	1703.	RESIDUAL	1301.	0	0.17	0.14	0.65
5 TIHRSG THERMIONIC POWR	0.	157.	788.	509.	111.	33.	695.	0.	1483.	COAL	1483.	0	0.10	0.07	0.74
5 TIHRSG THERMIONIC HEAT	0.	340.	1703.	1100.	240.	70.	0.	-402.	1703.	COAL	1301.	0	0.17	0.14	0.65
6 STIRL STIRLING-1 POWR	0.	153.	440.	210.	111.	33.	1047.	0.	1487.	DISTILLA	1487.	0	0.09	0.07	0.74
6 STIRL STIRLING-1 HEAT	0.	804.	2306.	1100.	581.	170.	0.	-1469.	2306.	DISTILLA	837.	0	0.26	0.25	0.48

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28001 MW 32.50 PROCESS MILLIONS BTU/HR 1100.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.101

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	153.	440.	210.	111.	33.	1047.	0.	1487.	RESIDUAL	1487.	0	0.09	0.07	0.74
6	STIRL	STIRLING-1	HEAT	0.	804.	2306.	1100.	581.	170.	0.	-1469.	2306.	RESIDUAL	837.	0	0.26	0.25	0.48
6	STIRL	STIRLING-1	POWR	0.	153.	440.	210.	111.	33.	1047.	0.	1487.	COAL	1487.	0	0.09	0.07	0.74
6	STIRL	STIRLING-1	HEAT	0.	804.	2306.	1100.	581.	170.	0.	-1469.	2306.	COAL	837.	0	0.26	0.25	0.48
7	HEGT85	HELIUM-GT-	POWR	0.	49.	345.	41.	111.	33.	1246.	0.	1592.	COAL-AFB	1592.	10	0.03	0.07	0.69
7	HEGT85	HELIUM-GT-	HEAT	0.	1323.	9304.	1100.	2987.	875.	0.	-8986.	9304.	COAL-AFB	317.	0	0.12	0.32	0.12
8	HEGT60	HELIUM-GT-	POWR	0.	65.	428.	124.	111.	33.	1148.	0.	1576.	COAL-AFB	1576.	10	0.04	0.07	0.70
8	HEGT60	HELIUM-GT-	HEAT	0.	573.	3785.	1100.	980.	287.	0	-2717.	3785.	COAL-AFB	1068.	0	0.13	0.26	0.29
9	HEGT00	HELIUM-GT-	POWR	0.	79.	630.	308.	111.	33.	932.	0.	1562.	COAL-AFB	1562.	10	0.05	0.07	0.70
9	HEGT00	HELIUM-GT-	HEAT	0.	281.	2252.	1100.	396.	116.	0.	-892.	2252.	COAL-AFB	1360.	0	0.11	0.18	0.49
10	FCMCCL	FUEL-CL-MO	POWR	0.	185.	365.	173.	111.	33.	1091.	0.	1456.	COAL	1456.	10	0.11	0.08	0.76
10	FCMCCL	FUEL-CL-MO	HEAT	0.	1178	2324.	1100.	706.	207.	0.	-1861.	2324.	COAL	463.	0	0.34	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	192.	295.	119.	111.	33.	1155.	0.	1449.	COAL	1449.	10	0.12	0.08	0.76
11	FCSTCL	FUEL-CL-ST	HEAT	0.	1777.	2732.	1100.	1029.	302.	0.	-2868.	2732.	COAL	-136.	0	0.39	0.38	0.40
12	IGGTST	INT-GAS-GT	POWR	0.	150.	399.	172.	111.	33.	1091.	0.	1490.	COAL	1490.	10	0.09	0.07	0.74
12	IGGTST	INT-GAS-GT	HEAT	0.	960.	2546.	1100.	708.	207.	0.	-1865.	2546.	COAL	681.	0	0.27	0.28	0.43
13	GTSOAR	GT-HRSG-10	POWR	0.	155.	382.	162.	111.	33.	1103.	0.	1486.	RESIDUAL	1486.	0	0.09	0.07	0.74
13	GTSOAR	GT-HRSG-10	HEAT	0.	1051.	2594.	1100.	752.	220.	0.	-2004.	2594.	RESIDUAL	590.	0	0.29	0.29	0.42
14	GTAC08	GT-HRSG-08	POWR	0.	184.	411.	211.	111.	33.	1045.	0.	1456.	RESIDUAL	1456.	0	0.11	0.08	0.76
14	GTAC08	GT-HRSG-08	HEAT	0.	960.	2138.	1100.	577.	169.	0.	-1457.	2138.	RESIDUAL	681.	0	0.31	0.27	0.51
15	GTAC12	GT-HRSG-12	POWR	0.	182.	364.	169.	111.	33.	1096.	0.	1459.	RESIDUAL	1459.	0	0.11	0.08	0.75
15	GTAC12	GT-HRSG-12	HEAT	0.	1183.	2370.	1100.	723.	212.	0.	-1912.	2370.	RESIDUAL	458.	0	0.33	0.31	0.46
16	GTAC16	GT-HRSG-16	POWR	0.	178.	343.	148.	111.	33.	1119.	0.	1463.	RESIDUAL	1463.	0	0.11	0.08	0.75
16	GTAC16	GT-HRSG-16	HEAT	0.	1318.	2544.	1100.	822.	241.	0.	-2221.	2544.	RESIDUAL	323.	0	0.34	0.32	0.43
17	GTWC16	GT-HRSG-16	POWR	0.	162.	352.	142.	111.	33.	1127.	0.	1479.	RESIDUAL	1479.	0	0.10	0.07	0.74
17	GTWC16	GT-HRSG-16	HEAT	0.	1252.	2718.	1100.	856.	251.	0.	-2329.	2718.	RESIDUAL	389.	0	0.32	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28001 MW 32.50 PROCESS MILLIONS BTU/HR 1100.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.101

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	0.	159.	298.	94.	111.	33.	1184.	0.	1481.	RESIDUAL	1481.	0	0.10	0.07	0.74
18	CC1626	GTST-16/26	HEAT	0.	1866.	3490.	1100.	1300.	381.	0.	-3716.	3490.	RESIDUAL	-226.	0	0.35	0.37	0.32
19	CC1622	GTST-16/22	POWR	0.	167.	302.	104.	111.	33.	1171.	0.	1474.	RESIDUAL	1474.	0	0.10	0.08	0.75
19	CC1622	GTST-16/22	HEAT	0.	1760.	3184.	1100.	1168.	342.	0.	-3304.	3184.	RESIDUAL	-120.	0	0.36	0.37	0.35
20	CC1222	GTST-12/22	POWR	0.	169.	301.	105.	111.	33.	1171.	0.	1472.	RESIDUAL	1472.	0	0.10	0.08	0.75
20	CC1222	GTST-12/22	HEAT	0.	1767.	3157.	1100.	1161.	340.	0.	-3283.	3157.	RESIDUAL	-126.	0	0.36	0.37	0.35
21	CC0822	GTST-08/22	POWR	0.	181.	322.	133.	111.	33.	1138.	0.	1460.	RESIDUAL	1460.	0	0.11	0.08	0.75
21	CC0822	GTST-08/22	HEAT	0.	1500.	2668.	1100.	919.	269.	0.	-2526.	2668.	RESIDUAL	141.	0	0.36	0.34	0.41
22	STIG15	STIG-15-16	POWR	0.	60.	291.	4.	111.	33.	1290.	0.	1581.	RESIDUAL	1581.	0	0.04	0.07	0.70
22	STIG15	STIG-15-16	HEAT	0.	17424.	84615.	1100.	32238.	9449.	0.	*******	84615.	RESIDUAL	-15783.	0	0.17	0.38	0.01
23	STIG10	STIG-10-16	POWR	0.	86.	309.	41.	111.	33.	1246.	0.	1555.	RESIDUAL	1555.	0	0.05	0.07	0.71
23	STIG10	STIG-10-16	HEAT	0.	2309.	8302.	1100.	2981.	874.	0.	-8970.	8302.	RESIDUAL	-668.	0	0.22	0.36	0.13
24	STIG1S	STIG-1S-16	POWR	0.	98.	331.	70.	111.	33.	1212.	0.	1543.	RESIDUAL	1543.	0	0.06	0.07	0.71
24	STIG1S	STIG-1S-16	HEAT	0.	1542.	5218.	1100.	1749.	513.	0.	-5120.	5218.	RESIDUAL	99.	0	0.23	0.34	0.21
25	DEADV3	DIESEL-ADV	POWR	0.	120.	299.	61.	111.	33.	1222.	0.	1521.	RESIDUAL	1521.	0	0.07	0.07	0.72
25	DEADV3	DIESEL-ADV	HEAT	0.	2149.	5366.	1100.	1991.	584.	0.	-58[illegible]	5366.	RESIDUAL	-509.	0	0.29	0.37	0.20
26	DEADV2	DIESEL-ADV	POWR	0.	137.	299.	76.	111.	33.	1205.	0.	1504.	RESIDUAL	1504.	1	0.08	0.07	0.73
26	DEADV2	DIESEL-ADV	HEAT	0.	1984.	4331.	1100.	1607.	471.	0.	-4674.	4331.	RESIDUAL	-344.	1	0.31	0.37	0.25
27	DEADV1	DIESEL-ADV	POWR	0.	185.	299.	117.	111.	33.	1157.	0.	1456.	RESIDUAL	1456.	1	0.11	0.08	0.76
27	DEADV1	DIESEL-ADV	HEAT	0.	1742.	2813.	1100.	1044.	306.	0.	-2915.	2813.	RESIDUAL	-102.	1	0.38	0.37	0.39
28	DEHTPM	ADV-DIESEL	POWR	0.	178.	339.	145.	111.	33.	1123.	0.	1462.	RESIDUAL	1462.	0	0.11	0.08	0.75
28	DEHTPM	ADV-DIESEL	HEAT	0.	1350.	2567.	1100.	840.	246.	0.	-2277.	2567.	RESIDUAL	290.	0	0.34	0.33	0.43
29	DESOA3	DIESEL-SOA	POWR	0.	101.	307.	53.	111.	33.	1232.	0.	1540.	DISTILLA	1540.	0	0.06	0.07	0.71
29	DESOA3	DIESEL-SOA	HEAT	0.	2118.	6433.	1100.	2322.	681.	0.	-6911.	6433.	DISTILLA	-478.	0	0.25	0.36	0.17
29	DESOA3	DIESEL-SOA	POWR	0.	101.	307.	53.	111.	33.	1232.	0.	1540.	RESIDUAL	1540.	0	0.06	0.07	0.71
29	DESOA3	DIESEL-SOA	HEAT	0.	2118.	6433.	1100.	2322.	681.	0.	-6911.	6433.	RESIDUAL	-478.	0	0.25	0.36	0.17

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28001 MW 32.50 PROCESS MILLIONS BTU/HR 1100.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 6760.

POWER TO HEAT RATIO 0.101

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	119.	307.	68.	111.	33.	1215.	0.	1522.	DISTILLA	1522.	1	0.07	0.07	0.72
30 DESOA2 DIESEL-SOA HEAT	0.	1935.	5000.	1100.	1805.	529.	0.	-5294.	5000.	DISTILLA	-294.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	119.	307.	68.	111.	33.	1215.	0.	1522.	RESIDUAL	1522.	1	0.07	0.07	0.72
30 DESOA2 DIESEL-SOA HEAT	0.	1935.	5000.	1100.	1805.	529.	0.	-5294.	5000.	RESIDUAL	-294.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	184.	307.	123.	111.	33.	1149.	0.	1456.	DISTILLA	1456.	1	0.11	0.08	0.76
31 DESOA1 DIESEL-SOA HEAT	0.	1646.	2743.	1100.	990.	290.	0.	-2748.	2743.	DISTILLA	-5.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	184.	307.	123.	111.	33.	1149.	0.	1456.	RESIDUAL	1456.	1	0.11	0.08	0.76
31 DESOA1 DIESEL-SOA HEAT	0.	1646.	2743.	1100.	990.	290.	0.	-2748.	2743.	RESIDUAL	-5.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	173.	380.	175.	111.	33.	1088.	0.	1468.	DISTILLA	1468.	0	0.11	0.08	0.75
32 GTSOAD GT-HRSG-10 HEAT	0.	1085.	2388.	1100.	697.	204.	0.	-1833.	2388.	DISTILLA	556.	0	0.31	0.29	0.46
33 GTRA08 GT-85RE-08 POWR	0.	159.	311.	104.	111.	33.	1171.	0.	1482.	DISTILLA	1482.	0	0.10	0.07	0.74
33 GTRA08 GT-85RE-08 HEAT	0.	1672.	3271.	1100.	1168.	342.	0.	-3303.	3271.	DISTILLA	-32.	0	0.34	0.36	0.34
34 GTRA12 GT-85RE-12 POWR	0.	163.	310.	107.	111.	33.	1168.	0.	1478.	DISTILLA	1478.	0	0.10	0.08	0.74
34 GTRA12 GT-85RE-12 HEAT	0.	1671.	3177.	1100.	1137.	333.	0.	-3208.	3177.	DISTILLA	-31.	0	0.34	0.36	0.35
35 GTRA16 GT-85RE-16 POWR	0.	164.	318.	115.	111.	33.	1159.	0.	1476.	DISTILLA	1476.	0	0.10	0.08	0.75
35 GTRA16 GT-85RE-16 HEAT	0.	1569.	3036.	1100.	1059.	310.	0.	-2984.	3036.	DISTILLA	71.	0	0.34	0.35	0.36
36 GTR208 GT-60RE-08 POWR	0.	164.	347.	139.	111.	33.	1130.	0.	1477.	DISTILLA	1477.	0	0.10	0.08	0.74
36 GTR208 GT-60RE-08 HEAT	0.	1294.	2736.	1100.	875.	257.	0.	-2389.	2736.	DISTILLA	347.	0	0.32	0.32	0.40
37 GTR212 GT-60RE-12 POWR	0.	163.	336.	130.	111.	33.	1141.	0.	1477.	DISTILLA	1477.	0	0.10	0.08	0.74
37 GTR212 GT-60RE-12 HEAT	0.	1383.	2845.	1100.	939.	275.	0.	-2587.	2845.	DISTILLA	258.	0	0.33	0.33	0.39
38 GTR216 GT-60RE-16 POWR	0.	167.	329.	127.	111.	33.	1145.	0.	1474.	DISTILLA	1474.	0	0.10	0.08	0.75
38 GTR216 GT-60RE-16 HEAT	0.	1446.	2857.	1100.	963.	282.	0.	-2662.	2857.	DISTILLA	195.	0	0.34	0.34	0.39
39 GTRW08 GT-85RE-08 POWR	0.	134.	316.	88.	111.	33.	1191.	0.	1507.	DISTILLA	1507.	0	0.08	0.07	0.73
39 GTRW08 GT-85RE-08 HEAT	0.	1678.	3966.	1100.	1392.	408.	0.	-4004.	3966.	DISTILLA	-38.	0	0.30	0.35	0.28
40 GTRW12 GT-85RE-12 POWR	0.	143.	305.	86.	111.	33.	1193.	0.	1497.	DISTILLA	1497.	0	0.09	0.07	0.73
40 GTRW12 GT-85RE-12 HEAT	0.	1828.	3880.	1100.	1412.	414.	0.	-4067.	3880.	DISTILLA	-187.	0	0.32	0.36	0.28

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28001 MW 32.50 PROCESS MILLIONS BTU/HR 1100.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.101

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	146.	311.	93.	111.	33.	1184.	0.	1495.	DISTILLA	1495.	0	0.09	0.07	0.74
41 GTRW16 GT-85RE-16 HEAT	0.	1717.	3659.	1100.	1306.	383.	0.	-3736.	3659.	DISTILLA	-77.	0	0.32	0.36	0.30
42 GTR308 GT-60RE-08 POWR	0.	124.	358.	115.	111.	33.	1159.	0.	1517.	DISTILLA	1517.	0	0.08	0.07	0.73
42 GTR308 GT-60RE-08 HEAT	0.	1187.	3429.	1100.	1063.	312.	0.	-2975.	3429.	DISTILLA	454.	0	0.26	0.31	0.32
43 GTR312 GT-60RE-12 POWR	0.	149.	324.	107.	111.	33.	1168.	0.	1492.	DISTILLA	1492.	0	0.09	0.07	0.74
43 GTR312 GT-60RE-12 HEAT	0.	1522.	3319.	1100.	1135.	333.	0.	-3200.	3319.	DISTILLA	118.	0	0.31	0.34	0.33
44 GTR316 GT-60RE-16 POWR	0.	148.	327.	109.	111.	33.	1166.	0.	1493.	DISTILLA	1493.	0	0.09	0.07	0.74
44 GTR316 GT-60RE-16 HEAT	0.	1490.	3296.	1100.	1117.	327.	0.	-3145.	3296.	DISTILLA	151.	0	0.31	0.34	0.33
45 FCPADS FUEL-CL-PH POWR	0.	113.	292.	50.	111.	33.	1236.	0.	1528.	DISTILLA	1528.	0	0.07	0.07	0.72
45 FCPADS FUEL-CL-PH HEAT	0.	2507.	6471.	1100.	2459.	721.	0.	-7337.	6471.	DISTILLA	-867.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	151.	269.	63.	111.	33.	1220.	0.	1489.	DISTILLA	1489.	0	0.09	0.07	0.74
46 FCMCDS FUEL-CL-MO HEAT	0.	2651.	4721.	1100.	1945.	570.	0.	-5732.	4721.	DISTILLA	-1011.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28002 MW 77.20 PROCESS MILLIONS BTU/HR 1054.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	1240.	823.	1240.	COAL-FGD	2063.	0	0.	0.13	0.51
1 STM141	STM-TURB-1	POWR	0.	45.	2019.	1452.	263.	77.	-469.	0.	2019.	RESIDUAL	2019.	0	0.02	0.13	0.52
1 STM141	STM-TURB-1	HEAT	0.	372.	1465.	1054.	191.	56.	0.	226.	1465.	RESIDUAL	1691.	0	0.18	0.11	0.62
1 STM141	STM-TURB-1	POWR	0.	45.	2019.	1452.	263.	77.	-469.	0.	2019.	COAL-FGD	2019.	0	0.02	0.13	0.52
1 STM141	STM-TURB-1	HEAT	0.	372.	1465.	1054.	191.	56.	0.	226.	1465.	COAL-FGD	1691.	0	0.18	0.11	0.62
1 STM141	STM-TURB-1	POWR	0.	45.	2019.	1452.	263.	77.	-469.	0.	2019.	COAL-AFB	2019.	0	0.02	0.13	0.52
1 STM141	STM-TURB-1	HEAT	0.	372.	1465.	1054.	191.	56.	0.	226.	1465.	COAL-AFB	1691.	0	0.18	0.11	0.62
2 STM088	STM-TURB-8	POWR	0.	-694.	2758.	2081.	263.	77.	-1208.	0.	2758.	RESIDUAL	2758.	0	-0.34	0.10	0.38
2 STM088	STM-TURB-8	HEAT	0.	260.	1397.	1054.	133.	39.	0.	406.	1397.	RESIDUAL	1803.	0	0.13	0.07	0.58
2 STM088	STM-TURB-8	POWR	0.	-694.	2758.	2081.	263.	77.	-1208.	0.	2758.	COAL-FGD	2758.	0	-0.34	0.10	0.38
2 STM088	STM-TURB-8	HEAT	0.	260.	1397.	1054.	133.	39.	0.	406.	1397.	COAL-FGD	1803.	0	0.13	0.07	0.58
2 STM088	STM-TURB-8	POWR	0.	-694.	2758.	2081.	263.	77.	-1208.	0.	2758.	COAL-AFB	2758.	0	-0.34	0.10	0.38
2 STM088	STM-TURB-8	HEAT	0.	260.	1397.	1054.	133.	39.	0.	406.	1397.	COAL-AFB	1803.	0	0.13	0.07	0.58
3 PFBSTM	PFB-STMTB-	POWR	0.	500.	1327.	854.	263.	77.	235.	0.	1563.	COAL-PFB	1563.	0	0.24	0.17	0.67
3 PFBSTM	PFB-STMTB-	HEAT	0.	618.	1638.	1054.	325.	95.	0.	-193.	1638.	COAL-PFB	1446.	0	0.27	0.20	0.64
4 TISTMT	TI-STMTB-1	POWR	0.	505.	1061.	631.	263.	77.	498.	0.	1559.	RESIDUAL	1559.	0	0.24	0.17	0.68
4 TISTMT	TI-STMTB-1	HEAT	0.	843.	1772.	1054.	440.	129.	0.	-552.	1772.	RESIDUAL	1220.	0	0.32	0.25	0.59
4 TISTMT	TI-STMTB-1	POWR	0.	505.	1061.	631.	263.	77.	498.	0.	1559.	COAL	1559.	0	0.24	0.17	0.68
4 TISTMT	TI-STMTB-1	HEAT	0.	843.	1772.	1054.	440.	129.	0.	-552.	1772.	COAL	1220.	0	0.32	0.25	0.59
5 TIHRSG	THERMIONIC	POWR	0.	191.	1872.	1209.	263.	77.	-182.	0.	1872.	RESIDUAL	1872.	0	0.09	0.14	0.56
5 TIHRSG	THERMIONIC	HEAT	0.	325.	1632.	1054.	230.	67.	0.	106.	1632.	RESIDUAL	1738.	0	0.16	0.13	0.61
5 TIHRSG	THERMIONIC	POWR	0.	191.	1872.	1209.	263.	77.	-182.	0.	1872.	COAL	1872.	0	0.09	0.14	0.56
5 TIHRSG	THERMIONIC	HEAT	0.	325.	1632.	1054.	230.	67.	0.	106.	1632.	COAL	1738.	0	0.16	0.13	0.61
6 STIRL	STIRLING-1	POWR	0.	365.	1045.	499.	263.	77.	653.	0.	1699.	DISTILLA	1699.	0	0.18	0.16	0.62
6 STIRL	STIRLING-1	HEAT	0.	770.	2209.	1054.	557.	163.	0.	-916.	2209.	DISTILLA	1293.	0	0.26	0.25	0.48

DATE 06/06/79 GENERAL ELECTRIC COMPANY

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28002 MW 77.20 PROCESS MILLIONS BTU/HR 1054.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	365.	1045.	499.	263.	77.	653.	0.	1699.	RESIDUAL	1699.	0	0.18	0.18	0.62
6 STIRL	STIRLING-1	HEAT	0.	770.	2209.	1054.	557.	163.	0.	-916.	2209.	RESIDUAL	1293.	0	0.26	0.25	0.48
6 STIRL	STIRLING-1	POWR	0.	365.	1045.	499.	263.	77.	653.	0.	1699.	COAL	1699.	0	0.16	0.16	0.62
6 STIRL	STIRLING-1	HEAT	0.	770.	2209.	1054.	557.	163.	0.	-916.	2209.	COAL	1293.	0	0.26	0.25	0.48
7 HEGT85	HELIUM-GT-	POWR	0.	117.	821.	97.	263.	77.	1126.	0.	1946.	COAL-AFB	1946.	0	0.06	0.14	0.54
7 HEGT85	HELIUM-GT-	HEAT	0.	1268.	8915.	1054.	2862.	839.	0.	-8119.	8915.	COAL-AFB	795.	0	0.12	0.32	0.12
8 HEGT60	HELIUM-G	POWR	0.	154.	1017.	296.	263.	77.	892.	0.	1909.	COAL-AFB	1909.	0	0.07	0.14	0.55
8 HEGT60	HELIUM-GT-	HEAT	0.	549.	3627.	1054.	939.	275.	0.	-2112.	3627.	COAL-AFB	1514.	0	0.13	0.26	0.29
9 HEGT00	HELIUM-GT-	POWR	0.	186.	1497.	731.	263.	77.	380.	0.	1877.	COAL-AFB	1877.	0	0.03	0.14	0.56
9 HEGT00	HELIUM-GT-	HEAT	0.	269.	2158.	1054.	380.	111.	0.	-364.	2158.	COAL-AFB	1794.	0	0.11	0.18	0.49
10 FCMCCL	FUEL-CL-MO	POWR	0.	439.	866.	410.	263.	77.	757.	0.	1624.	COAL	1624.	10	0.21	0.16	0.65
10 FCMCCL	FUEL-CL-MO	HEAT	0.	1129.	2227.	1054.	677.	198.	0.	-1292.	2227.	COAL	934.	0	0.34	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	455.	700.	282.	263.	77.	909.	0.	1608.	COAL	1608.	10	0.22	0.16	0.66
11 FCSTCL	FUEL-CL-ST	HEAT	0.	1702.	2618.	1054.	986.	289.	0.	-2257.	2618.	COAL	361.	0	0.39	0.38	0.40
12 IGGTST	INT-GAS-GT	POWR	0.	357.	948.	409.	263.	77.	758.	0.	1706.	COAL	1706.	10	0.17	0.15	0.62
12 IGGTST	INT-GAS-GT	HEAT	0.	919.	2440.	1054.	678.	199.	0.	-1296.	2440.	COAL	1144.	0	0.27	0.28	0.43
13 GTSOAR	GT-HRSG-10	POWR	0.	368.	908.	385.	263.	77.	787.	0.	1695.	RESIDUAL	1695.	0	0.18	0.16	0.62
13 GTSOAR	GT-HRSG-10	HEAT	0.	1007.	2486.	1054.	721.	211.	0.	-1429.	2486.	RESIDUAL	1056.	0	0.29	0.29	0.42
14 GTAC08	GT-HRSG-08	POWR	0.	438.	976.	502.	263.	77.	649.	0.	1625.	RESIDUAL	1625.	0	0.21	0.16	0.65
14 GTAC08	GT-HRSG-08	HEAT	0.	920.	2048.	1054.	553.	162.	0.	-905.	2048.	RESIDUAL	1143.	0	0.31	0.27	0.51
15 GTAC12	GT-HRSG-12	POWR	0.	431.	864.	401.	263.	77.	768.	0.	1632.	RESIDUAL	1632.	0	0.21	0.16	0.65
15 GTAC12	GT-HRSG-12	HEAT	0.	1134.	2271.	1054.	693.	203.	0.	-1341.	2271.	RESIDUAL	930.	0	0.33	0.31	0.46
16 GTAC16	GT-HRSG-16	POWR	0.	423.	815	353.	253.	77.	825.	0.	1641.	RESIDUAL	1641.	0	0.20	0.16	0.64
16 GTAC16	GT-HRSG-16	HEAT	0.	1263.	2437.	1054.	787.	231.	0.	-1637.	2437.	RESIDUAL	800.	0	0.34	0.32	0.43
17 GTWC16	GT-HRSG-16	POWR	0.	385.	836.	338.	263.	77.	842.	0.	1678.	RESIDUAL	1678.	0	0.19	0.16	0.63
17 GTWC16	GT-HRSG-16	HEAT	0.	1199.	2605.	1054.	820.	240.	0.	-1741.	2605.	RESIDUAL	864.	0	0.32	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28002 MW 77.20 PROCESS MILLIONS BTU/HR 1054.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	378.	707.	223.	263.	77.	978.	0.	1685.	RESIDUAL	1685.	0	0.18	0.16	0.63
18 CC1626 GTST-16/26 HEAT	0.	1788.	3344.	1054.	1246.	365.	0.	-3070.	3344.	RESIDUAL	275.	0	0.35	0.37	0.32
19 CC1622 GTST-16/22 POWR	0.	397.	718.	248.	263.	77.	948.	0.	1666.	RESIDUAL	1666.	0	0.19	0.16	0.63
19 CC1622 GTST-16/22 HEAT	0.	1687.	3051.	1054.	1119.	328.	0.	-2675.	3051.	RESIDUAL	376.	0	0.36	0.37	0.35
20 CC1222 GTST-12/22 POWR	0.	401.	716.	249.	263.	77.	946.	0.	1662.	RESIDUAL	1662.	0	0.19	0.16	0.63
20 CC1222 GTST-12/22 HEAT	0.	1693.	3025.	1054.	1113.	326.	0.	-2654.	3025.	RESIDUAL	370.	0	0.36	0.37	0.35
21 CC0822 GTST-08/22 POWR	0.	430.	764.	315.	263.	77.	869.	0.	1634.	RESIDUAL	1634.	0	0.21	0.16	0.65
21 CC0822 GTST-08/22 HEAT	0.	1437.	2556.	1054.	881.	258.	0.	-1930.	2556.	RESIDUAL	626.	0	0.36	0.34	0.41
22 STIG15 STIG-15-16 POWR	0.	142.	691.	9.	263.	77.	1229.	0.	1921.	RESIDUAL	1921.	0	0.07	0.14	0.55
22 STIG15 STIG-15-16 HEAT	0.	16695.	81077.	1054.	30890.	9053.	0.	-95709.	81077.	RESIDUAL	-14632.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	204.	734.	97.	263.	77.	1126.	0.	1859.	RESIDUAL	1859.	0	0.10	0.14	0.57
23 STIG10 STIG-10-16 HEAT	0.	2212.	7955.	1054.	2857.	837.	0.	-8104.	7955.	RESIDUAL	-149.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	232.	786.	166.	263.	77.	1045.	0.	1831.	RESIDUAL	1831.	0	0.11	0.14	0.58
24 STIG1S STIG-1S-16 HEAT	0.	1478.	5000.	1054.	1676.	491.	0.	-4414.	5000.	RESIDUAL	586.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	284.	710.	146.	263.	77.	1069.	0.	1779.	RESIDUAL	1779.	0	0.14	0.15	0.59
25 DEADV3 DIESEL-ADV HEAT	0.	2059.	5142.	1054.	1908.	559.	0.	-5138.	5142.	RESIDUAL	4.	0	0.29	0.37	0.20
26 DEADV2 DIESEL-ADV POWR	0.	325.	710.	180.	263.	77.	1028.	0.	1738.	RESIDUAL	1738.	1	0.16	0.15	0.61
26 DEADV2 DIESEL-ADV HEAT	0.	1901.	4150.	1054.	1540.	451.	0.	-3988.	4150.	RESIDUAL	162.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	440.	710.	278.	263.	77.	913.	0.	1623.	RESIDUAL	1623.	1	0.21	0.16	0.65
27 DEADV1 DIESEL-ADV HEAT	0.	1670.	2696.	1054.	1000.	293.	0.	-2302.	2696.	RESIDUAL	394.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	424.	805.	345.	263.	77.	834.	0.	1639.	RESIDUAL	1639.	0	0.21	0.16	0.64
28 DEHTPM ADV-DIESEL HEAT	0.	1294.	2460.	1054.	804.	236.	0.	-1691.	2460.	RESIDUAL	769.	0	0.34	0.33	0.43
29 DESOA3 DIESEL-SOA POWR	0.	240.	730.	125.	263.	77.	1093.	0.	1823.	DISTILLA	1823.	0	0.12	0.14	0.58
29 DESOA3 DIESEL-SOA HEAT	0.	2030.	6164.	1054.	2225.	652.	0.	-6131.	6164.	DISTILLA	33.	0	0.25	0.36	0.17
29 DESOA3 DIESEL-SOA POWR	0.	240.	730.	125.	263.	77.	1093.	0.	1823.	RESIDUAL	1823.	0	0.12	0.14	0.58
29 DESOA3 DIESEL-SOA HEAT	0.	2030.	6164.	1054.	2225.	652.	0.	-6131.	6164.	RESIDUAL	33.	0	0.25	0.36	0.17

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28002 MW 77.20 PROCESS MILLIONS BTU/HR 1054.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	282.	730.	161.	263.	77.	1051.	0.	1781.	DISTILLA	1781.	1	0.14	0.15	0.59
30	DESOA2	DIESEL-SOA	HEAT	0.	1854.	4791.	1054.	1730.	507.	0.	-4582.	4791.	DISTILLA	209.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	282.	730.	161.	263.	77.	1051.	0.	1781.	RESIDUAL	1781.	1	0.14	0.15	0.59
30	DESOA2	DIESEL-SOA	HEAT	0.	1854.	4791.	1054.	1730.	507.	0.	-4582.	4791.	RESIDUAL	209.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	438.	730.	293.	263.	77.	896.	0.	1625.	DISTILLA	1625.	1	0.21	0.16	0.65
31	DESOA1	DIESEL-SOA	HEAT	0.	1577.	2628.	1054.	949.	278.	0.	-2142.	2628.	DISTILLA	486.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	438.	730.	293.	263.	77.	896.	0.	1625.	RESIDUAL	1625.	1	0.21	0.16	0.65
31	DESOA1	DIESEL-SOA	HEAT	0.	1577.	2628.	1054.	949.	278.	0.	-2142	2628.	RESIDUAL	486.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	410.	902.	415.	263.	77.	751.	0.	1653.	DISTILLA	1653.	0	0.20	0.16	0.64
32	GTSOAD	GT-HRSG-10	HEAT	0.	1040.	2288.	1054.	668.	196.	0.	-1265.	2288.	DISTILLA	1023.	0	0.31	0.29	0.46
33	GTRA08	GT-85RE-08	POWR	0.	377.	738.	248.	263.	77.	948.	0.	1686.	DISTILLA	1686.	0	0.18	0.16	0.63
33	GTRA08	GT-85RE-08	HEAT	0.	1602.	3135.	1054.	1119.	328.	0.	-2674.	3135.	DISTILLA	461.	0	0.34	0.36	0.34
34	GTRA12	GT-85RE-12	POWR	0.	387.	736.	255.	263.	77.	940.	0.	1676.	DISTILLA	1676.	0	0.19	0.16	0.63
34	GTRA12	GT-85RE-12	HEAT	0.	1602.	3044.	1054.	1090.	319.	0.	-2583.	3044.	DISTILLA	462.	0	0.34	0.36	0.35
35	GTRA16	GT-85RE-16	POWR	0.	390.	755.	273.	263.	77.	918.	0.	1673.	DISTILLA	1673.	0	0.19	0.16	0.63
35	GTRA16	GT-85RE-16	HEAT	0.	1504.	2909.	1054.	1015.	298.	0.	-2349.	2909.	DISTILLA	560.	0	0.34	0.35	0.36
36	GTR208	GT-60RE-08	POWR	0.	389.	823.	331.	263.	77.	851.	0.	1674.	DISTILLA	1674.	0	0.19	0.16	0.63
36	GTR208	GT-60RE-08	HEAT	0.	1240.	2621.	1054.	839.	246.	0.	-1798.	2621.	DISTILLA	823.	0	0.32	0.32	0.40
37	GTR212	GT-60RE-12	POWR	0.	388.	798.	309.	263.	77.	877.	0.	1675.	DISTILLA	1675.	0	0.19	0.16	0.63
37	GTR212	GT-60RE-12	HEAT	0.	1325.	2726.	1054.	900.	264.	0.	-1988.	2726.	DISTILLA	738.	0	0.33	0.33	0.39
38	GTR216	GT-60RE-16	POWR	0.	396.	782.	301.	263.	77.	886.	0.	1668.	DISTILLA	1668.	0	0.19	0.16	0.63
38	GTR216	GT-60RE-16	HEAT	0.	1385.	2737.	1054.	922.	270.	0.	-2060.	2737.	DISTILLA	678.	0	0.34	0.34	0.39
39	GTRW08	GT-85RE-08	POWR	0.	318.	750.	208.	263.	77.	995.	0.	1746.	DISTILLA	1746.	0	0.15	0.15	0.60
39	GTRW08	GT-85RE-08	HEAT	0.	1608.	3800.	1054.	1334.	391.	0.	-3345.	3800.	DISTILLA	455.	0	0.30	0.35	0.28
40	GTRW12	GT-85RE-12	POWR	0.	341.	724.	205.	263.	77.	999.	0.	1722.	DISTILLA	1722.	0	0.17	0.15	0.61
40	GTRW12	GT-85RE-12	HEAT	0.	1751.	3718.	1054.	1353.	397.	0.	-3406.	3718.	DISTILLA	312.	0	0.32	0.36	0.28

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28002 MW 77.20 PROCESS MILLIONS BTU/HR 1054.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.250

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	346.	738.	222.	263.	77.	979.	0.	1717.	DISTILLA	1717.	0	0.17	0.15	0.61
41 GTRW16 GT-85RE-16 HEAT	0.	1645.	3506.	1054.	1252.	367.	0.	-3089.	3506.	DISTILLA	418.	0	0.32	0.36	0.30
42 GTR308 GT-60RE-08 POWR	0.	294.	850.	273.	263.	77.	919.	0.	1769.	DISTILLA	1769.	0	0.14	0.15	0.60
42 GTR308 GT-60RE-08 HEAT	0.	1137.	3286.	1054.	1019.	299.	0.	-2360.	3286.	DISTILLA	926.	0	0.26	0.31	0.32
43 GTR312 GT-60RE-12 POWR	0.	353.	770.	255.	263.	77.	940.	0.	1710.	DISTILLA	1710.	0	0.17	0.15	0.62
43 GTR312 GT-60RE-12 HEAT	0.	1459.	3180.	1054.	1088.	319.	0.	-2576.	3180.	DISTILLA	605.	0	0.31	0.34	0.33
44 GTR316 GT-60RE-16 POWR	0.	351.	777.	259.	263.	77.	935.	0.	1712.	DISTILLA	1712.	0	0.17	0.15	0.62
44 GTR316 GT-60RE-16 HEAT	0.	1428.	3158.	1054.	1071.	314.	0.	-2523.	3158.	DISTILLA	636.	0	0.31	0.34	0.33
45 FCPADS FUEL-CL-PH POWR	0.	269.	693.	118.	263.	77.	1101.	0.	1795.	DISTILLA	1795.	0	0.13	0.15	0.59
45 FCPADS FUEL-CL-PH HEAT	0.	2403.	6200.	1054.	2356.	691.	0.	-6539.	6200.	DISTILLA	-339.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	359.	639.	149.	263.	77.	1065.	0.	1704.	DISTILLA	1704.	0	0.17	0.15	0.62
46 FCMCDS FUEL-CL-MO HEAT	0.	2541.	4524.	1054.	1864.	546.	0.	-5001.	4524.	DISTILLA	-477.	0	0.36	0.41	0.23

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28003 MW 97.20 PROCESS MILLIONS BTU/HR 947.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.350

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	1114.	1036.	1114.	COAL-FGD	2151.	0	0.	0.15	0.44
1 STM141 STM-TURB-1 POWR	0.	-391.	2541.	1829.	332.	97.	-1037.	0.	2541.	RESIDUAL	2541.	0	-0.18	0.13	0.37
1 STM141 STM-TURB-1 HEAT	0.	335.	1316.	947.	172.	50.	0.	500.	1316.	RESIDUAL	1816.	0	0.16	0.09	0.52
1 STM141 STM-TURB-1 POWR	0.	-391.	2541.	1829.	332.	97.	-1037.	0.	2541.	COAL-FGD	2541.	0	-0.18	0.13	0.37
1 STM141 STM-TURB-1 HEAT	0.	335.	1316.	947.	172.	50.	0.	500.	1316.	COAL-FGD	1816.	0	0.16	0.09	0.52
1 STM141 STM-TURB-1 POWR	0.	-391.	2541.	1829.	332.	97.	-1037.	0.	2541.	COAL-AFB	2541.	0	-0.18	0.13	0.37
1 STM141 STM-TURB-1 HEAT	0.	335.	1316.	947.	172.	50.	0.	500.	1316.	COAL-AFB	1816.	0	0.16	0.09	0.52
2 STM088 STM-TURB-8 POWR	0.	-1322.	3472.	2620.	332.	97.	-1968.	0.	3472.	RESIDUAL	3472.	0	-0.61	0.10	0.27
2 STM088 STM-TURB-8 HEAT	0.	234.	1255.	947.	120.	35.	0.	662.	1255.	RESIDUAL	1917.	0	0.11	0.06	0.49
2 STM088 STM-TURB-8 POWR	0.	-1322.	3472.	2620.	332.	97.	-1968.	0.	3472.	COAL-FGD	3472.	0	-0.61	0.10	0.27
2 STM088 STM-TURB-8 HEAT	0.	234.	1255.	947.	120.	35.	0.	662.	1255.	COAL-FGD	1917.	0	0.11	0.06	0.49
2 STM088 STM-TURB-8 POWR	0.	-1322.	3472.	2620.	332.	97.	-1968.	0.	3472.	COAL-AFB	3472.	0	-0.61	0.10	0.27
2 STM088 STM-TURB-8 HEAT	0.	234.	1255.	947.	120.	35.	0.	662.	1255.	COAL-AFB	1917.	0	0.11	0.06	0.49
3 PFBSTM PFB-STMTB- POWR	0.	479.	1671.	1075.	332.	97.	-151.	0.	1671.	COAL-PFB	1671.	0	0.22	0.20	0.57
3 PFBSTM PFB-STMTB- HEAT	0.	555.	1472.	947.	292.	86.	0.	124.	1472.	COAL-PFB	1596.	0	0.26	0.18	0.59
4 TISTMT TI-STMTB-1 POWR	0.	635.	1336.	795.	332.	97.	179.	0.	1515.	RESIDUAL	1515.	0	0.30	0.22	0.62
4 TISTMT TI-STMTB-1 HEAT	0.	757.	1592.	947.	395.	116.	0.	-199.	1592.	RESIDUAL	1393.	0	0.32	0.25	0.59
4 TISTMT TI-STMTB-1 POWR	0.	635.	1336.	795.	332.	97.	179.	0.	1515.	COAL	1515.	0	0.30	0.22	0.62
4 TISTMT TI-STMTB-1 HEAT	0.	757.	1592.	947.	395.	116.	0.	-199.	1592.	COAL	1393.	0	0.32	0.25	0.59
5 TIHRSG THERMIONIC POWR	0.	-207.	2357.	1522.	332.	97.	-677.	0.	2357.	RESIDUAL	2357.	0	-0.10	0.14	0.40
5 TIHRSG THERMIONIC HEAT	0.	292.	1466.	947.	206.	60.	0.	392.	1466.	RESIDUAL	1858.	0	0.14	0.11	0.51
5 TIHRSG THERMIONIC POWR	0.	-207.	2357.	1522.	332.	97.	-677.	0.	2357.	COAL	2357.	0	-0.10	0.14	0.40
5 TIHRSG THERMIONIC HEAT	0.	292.	1466.	947.	206.	60.	0.	392.	1466.	COAL	1858.	0	0.14	0.11	0.51
6 STIRL STIRLING-1 POWR	0.	459.	1316.	628.	332.	97.	375.	0.	1692.	DISTILLA	1692.	0	0.21	0.20	0.56
6 STIRL STIRLING-1 HEAT	0.	692.	1985.	947.	500.	147.	0.	-526.	1985.	DISTILLA	1458.	0	0.26	0.25	0.48

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28003 MW 97.20 PROCESS MILLIONS BTU/HR 947.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.350

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	459.	1316.	628.	332.	97.	375.	0.	1692.	RESIDUAL	1692.	0	0.21	0.20	0.56
6 STIRL STIRLING-1 HEAT	0.	692.	1985.	947.	500.	147.	0.	-526.	1985.	RESIDUAL	1458.	0	0.26	0.25	0.48
6 STIRL STIRLING-1 POWR	0.	459.	1316.	628.	332.	97.	375.	0.	1692.	COAL	1692.	0	0.21	0.20	0.56
6 STIRL STIRLING-1 HEAT	0.	692.	1985.	947.	500.	147.	0.	-526.	1985.	COAL	1458.	0	0.26	0.25	0.48
7 HEGT85 HELIUM-GT- POWR	0.	147.	1033.	122.	332.	97.	970.	0.	2004.	COAL-AFB	2004.	0	0.07	0.17	0.47
7 HEGT85 HELIUM-GT- HEAT	0.	1139.	8010.	947.	2571.	754.	0.	-6998.	8010.	COAL-AFB	1011.	0	0.12	0.32	0.12
8 HEGT60 HELIUM-GT- POWR	0.	194.	1280.	372.	332.	97.	676.	0.	1957.	COAL-AFB	1957.	0	0.09	0.17	0.48
8 HEGT60 HELIUM-GT- HEAT	0.	493.	3258.	947.	844.	247.	0.	-1601.	3258.	COAL-AFB	1658.	0	0.13	0.26	0.29
9 HEGT00 HELIUM-GT- POWR	0.	235.	1884.	920.	332.	97.	31.	0.	1916.	COAL-AFB	1916.	0	0.11	0.17	0.49
9 HEGT00 HELIUM-GT- HEAT	0.	242.	1939.	947.	341.	100.	0.	-30.	1939.	COAL-AFB	1909.	0	0.11	0.18	0.49
10 FCMCCL FUEL-CL-MO POWR	0.	553.	1091.	516.	332.	97.	507.	0.	1598.	COAL	1598.	10	0.26	0.21	0.59
10 FCMCCL FUEL-CL-MO HEAT	0.	1014.	2001.	947.	608.	178.	0.	-864.	2001.	COAL	1136.	0	0.34	0.30	0.47
11 FCSTCL FUEL-CL-ST POWR	0.	573.	881.	355.	332.	97.	697.	0.	1578.	COAL	1578.	10	0.27	0.21	0.60
11 FCSTCL FUEL-CL-ST HEAT	0.	1530.	2352.	947.	886.	260.	0.	-1731.	2352.	COAL	621.	0	0.39	0.38	0.40
12 IGGTST INT-GAS-GT POWR	0.	450.	1193.	516.	332.	97.	508.	0.	1701.	COAL	1701.	0	0.21	0.19	0.56
12 IGGTST INT-GAS-GT HEAT	0.	826.	2192.	947.	609.	179.	0.	-867.	2192.	COAL	1324.	0	0.27	0.28	0.43
13 GTSOAR GT-HRSG-10 POWR	0.	463.	1144.	485.	332.	97.	544.	0.	1687.	RESIDUAL	1687.	0	0.22	0.20	0.56
13 GTSOAR GT-HRSG-10 HEAT	0.	905.	2233.	947.	648.	190.	0.	-987.	2233.	RESIDUAL	1246.	0	0.29	0.29	0.42
14 GTAC08 GT-HRSG-08 POWR	0.	552.	1228.	632.	332.	97.	371.	0.	1599.	RESIDUAL	1599.	0	0.26	0.21	0.59
14 GTAC08 GT-HRSG-08 HEAT	0.	827.	1840.	947.	497.	146.	0.	-516.	1840.	RESIDUAL	1324.	0	0.31	0.27	0.51
15 GTAC12 GT-HRSG-12 POWR	0.	543.	1087.	505.	332.	97.	520.	0.	1608.	RESIDUAL	1608.	0	0.25	0.21	0.59
15 GTAC12 GT-HRSG-12 HEAT	0.	1018.	2040.	947.	622.	182.	0.	-908.	2040.	RESIDUAL	1132.	0	0.33	0.31	0.46
16 GTAC16 GT-HRSG-16 POWR	0.	532.	1027.	444.	332.	97.	592.	0.	1619.	RESIDUAL	1619.	0	0.25	0.20	0.59
16 GTAC16 GT-HRSG-16 HEAT	0.	1135.	2190.	947.	707.	207.	0.	-1174.	2190.	RESIDUAL	1016.	0	0.34	0.32	0.43
17 GTWC16 GT-HRSG-16 POWR	0.	485.	1053.	426.	332.	97.	613.	0.	1666.	RESIDUAL	1666.	0	0.23	0.20	0.57
17 GTWC16 GT-HRSG-16 HEAT	0.	1078.	2340.	947.	737.	216.	0.	-1267.	2340.	RESIDUAL	1073.	0	0.32	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28003 MW 97.20 PROCESS MILLIONS BTU/HR 947.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.350

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	476.	890.	281.	332.	97.	784.	0.	1674.	RESIDUAL	1674.	0	0.22	0.20	0.57
18 CC1626 GTST-16/26 HEAT	0.	1607.	3005.	947.	1119.	328.	0.	-2461.	3005.	RESIDUAL	544.	0	0.35	0.37	0.32
19 CC1622 GTST-16/22 POWR	0.	500.	904.	312.	332.	97.	747.	0.	1651.	RESIDUAL	1651.	0	0.23	0.20	0.57
19 CC1622 GTST-16/22 HEAT	0.	1516.	2741.	947.	1006.	295.	0.	-2106.	2741.	RESIDUAL	635.	0	0.36	0.37	0.35
20 CC1222 GTST-12/22 POWR	0.	505.	901.	314.	332.	97.	745.	0.	1646.	RESIDUAL	1646.	0	0.23	0.20	0.58
20 CC1222 GTST-12/22 HEAT	0.	1521.	2718.	947.	1000.	293.	0.	-2088.	2718.	RESIDUAL	629.	0	0.36	0.37	0.35
21 CC0822 GTST-08/22 POWR	0.	541.	962.	397.	332.	97.	647.	0.	1610.	RESIDUAL	1610.	0	0.25	0.21	0.59
21 CC0822 GTST-08/22 HEAT	0.	1291.	2297.	947.	791.	232.	0.	-1437.	2297.	RESIDUAL	860.	0	0.36	0.34	0.41
22 STIG15 STIG-15-16 POWR	0.	179.	870.	11.	332.	97.	1101.	0.	1971.	RESIDUAL	1971.	0	0.08	0.17	0.48
22 STIG15 STIG-15-16 HEAT	0.	15000.	72846.	947.	27754.	8134.	0.	-85696.	72846.	RESIDUAL	-12850.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	257.	924.	122.	332.	97.	970.	0.	1894.	RESIDUAL	1894.	0	0.12	0.18	0.50
23 STIG10 STIG-10-16 HEAT	0.	1987.	7147.	947.	2567.	752.	0.	-6984.	7147.	RESIDUAL	163.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	292.	989.	209.	332.	97.	869.	0.	1858.	RESIDUAL	1858.	0	0.14	0.18	0.51
24 STIG1S STIG-1S-16 HEAT	0.	1328.	4492.	947.	1506.	441.	0.	-3669.	4492.	RESIDUAL	823.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	358.	894.	183.	332.	97.	899.	0.	1792.	RESIDUAL	1792.	0	0.17	0.19	0.53
25 DEADV3 DIESEL-ADV HEAT	0.	1850.	4620.	947.	1714.	502.	0.	-4320.	4620.	RESIDUAL	300.	0	0.29	0.37	0.20
26 DEADV2 DIESEL-ADV POWR	0.	410.	894.	227.	332.	97.	847.	0.	1741.	RESIDUAL	1741.	1	0.19	0.19	0.54
26 DEADV2 DIESEL-ADV HEAT	0.	1708.	3728.	947.	1383.	405.	0.	-3286.	3728.	RESIDUAL	442.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	554.	894.	350.	332.	97.	703.	0.	1597.	RESIDUAL	1597.	1	0.26	0.21	0.59
27 DEADV1 DIESEL-ADV HEAT	0.	1500.	2422	947	899.	263.	0.	-1772.	2422.	RESIDUAL	650.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	533.	1014.	435.	332.	97.	603.	0.	1617.	RESIDUAL	1617.	0	0.25	0.21	0.59
28 DEHTPM ADV-DIESEL HEAT	0.	1163.	2210.	947.	723.	212.	0.	-1222.	2210.	RESIDUAL	988.	0	0.34	0.33	0.43
29 DESOA3 DIESEL-SOA POWR	0.	303.	919.	157.	332.	97.	929.	0.	1848.	DISTILLA	1848.	0	0.14	0.18	0.51
29 DESOA3 DIESEL-SOA HEAT	0.	1824.	5539.	947.	1999.	586.	0.	-5212.	5539.	DISTILLA	327.	0	0.25	0.36	0.17
29 DESOA3 DIESEL-SOA POWR	0.	303.	919.	157.	332.	97.	929.	0.	1848.	RESIDUAL	1848.	0	0.14	0.18	0.51
29 DESOA3 DIESEL-SOA HEAT	0.	1824.	5539.	947.	1999.	586.	0.	-5212.	5539.	RESIDUAL	327.	0	0.25	0.36	0.17

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28003 MW 97.20 PROCESS MILLIONS BTU/HR 947.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.350

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	355.	919.	202.	332.	97.	876.	0.	1795.	DISTILLA	1795.	1	0.17	0.18	0.53
30 DESOA2 DIESEL-SOA HEAT	0.	1666.	4305.	947.	1554.	455.	0.	-3820.	4305.	DISTILLA	485.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	355.	919.	202.	332.	97.	876.	0.	1795.	RESIDUAL	1795.	1	0.17	0.18	0.53
30 DESOA2 DIESEL-SOA HEAT	0.	1666.	4305.	947.	1554.	455.	0.	-3820.	4305.	RESIDUAL	485.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	551.	919.	368.	332.	97.	681.	0.	1599.	DISTILLA	1599.	1	0.26	0.21	0.59
31 DESOA1 DIESEL-SOA HEAT	0.	1417.	2362.	947.	853.	250.	0.	-1628.	2362.	DISTILLA	734.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	551.	919.	368.	332.	97.	681.	0.	1599.	RESIDUAL	1599.	1	0.26	0.21	0.59
31 DESOA1 DIESEL-SOA HEAT	0.	1417.	2362.	947.	853.	250.	0.	-1628.	2362.	RESIDUAL	734.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	516.	1136.	523.	332.	97.	499.	0.	1634.	DISTILLA	1634.	0	0.24	0.20	0.58
32 GTSOAD GT-HRSG-10 HEAT	0.	934.	2056.	947.	600.	176.	0.	-840.	2056.	DISTILLA	1216.	0	0.31	0.29	0.46
33 GTRA08 GT-85RE-08 POWR	0.	475.	929.	312.	332.	97.	747.	0.	1676.	DISTILLA	1676.	0	0.22	0.20	0.57
33 GTRA08 GT-85RE-08 HEAT	0.	1440.	2816.	947.	1005.	295.	0.	-2106.	2816.	DISTILLA	711.	0	0.34	0.36	0.34
34 GTRA12 GT-85RE-12 POWR	0.	487.	926.	321.	332.	97.	737.	0.	1663.	DISTILLA	1663.	0	0.23	0.20	0.57
34 GTRA12 GT-85RE-12 HEAT	0.	1439.	2735.	947.	979.	287.	0.	-2024.	2735.	DISTILLA	712.	0	0.34	0.36	0.35
35 GTRA16 GT-85RE-16 POWR	0.	491.	950.	344.	332.	97.	709.	0.	1659.	DISTILLA	1659.	0	0.23	0.20	0.57
35 GTRA16 GT-85RE-16 HEAT	0.	1351.	2613.	947.	912.	267.	0.	-1814.	2613.	DISTILLA	800.	0	0.34	0.35	0.36
36 GTR208 GT-60RE-08 POWR	0.	490.	1036.	417.	332.	97.	624.	0.	1660	DISTILLA	1660.	0	0.23	0.20	0.57
36 GTR208 GT-60RE-08 HEAT	0.	1114.	2355.	947.	754.	221.	0.	-1319.	2355.	DISTILLA	1036.	0	0.32	0.32	0.40
37 GTR212 GT-60RE-12 POWR	0.	489.	1005.	389.	332.	97.	657.	0.	1662.	DISTILLA	1662.	0	0.23	0.20	0.57
37 GTR212 GT-60RE-12 HEAT	0.	1191.	2449.	947.	808.	237.	0.	-1490.	2449.	DISTILLA	960.	0	0.33	0.33	0.39
38 GTR216 GT-60RE-16 POWR	0.	498.	984.	379.	332.	97.	668.	0.	1652.	DISTILLA	1652.	0	0.23	0.20	0.57
38 GTR216 GT-60RE-16 HEAT	0.	1245.	2439.	947.	829.	243.	0.	-1554.	2459.	DISTILLA	906.	0	0.34	0.34	0.39
39 GTRW08 GT-85RE-08 POWR	0.	400.	945.	262.	332.	97.	806.	0.	1751.	DISTILLA	1751.	0	0.19	0.19	0.54
39 GTRW08 GT-85RE-08 HEAT	0.	1445.	3414.	947.	1198.	351.	0.	-2709.	3414.	DISTILLA	706.	0	0.30	0.35	0.28
40 GTRW12 GT-85RE-12 POWR	0.	429.	911.	258.	332.	97.	810.	0.	1721.	DISTILLA	1721.	0	0.20	0.19	0.55
40 GTRW12 GT-85RE-12 HEAT	0.	1573.	3340.	947.	1216.	356.	0.	-2763.	3340.	DISTILLA	577.	0	0.32	0.36	0.28

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28003 MW 97.20 PROCESS MILLIONS BTU/HR 947.0 PROCESS TEMP(F) 366. PRODUCT CHEM HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.350

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	436.	929.	279.	332.	97.	786.	0.	1715.	DISTILLA	1715.	0	0.20	0.19	0.55
41 GTRW16 GT-85RE-16 HEAT	0.	1478.	3150.	947.	1125.	330.	0.	-2478.	3150.	DISTILLA	672.	0	0.32	0.36	0.30
42 GTR308 GT-60RE-08 POWR	0.	370.	1070.	343.	332.	97.	710.	0.	1780.	DISTILLA	1780.	0	0.17	0.19	0.53
42 GTR308 GT-60RE-08 HEAT	0.	1022.	2952.	947.	915.	268.	0.	-1823.	2952.	DISTILLA	1129.	0	0.26	0.31	0.32
43 GTR312 GT-60RE-12 POWR	0.	445.	970.	321.	332.	97.	736.	0.	1706.	DISTILLA	1706.	0	0.21	0.19	0.56
43 GTR312 GT-60RE-12 HEAT	0.	1311.	2857.	947.	977.	286.	0.	-2017.	2857.	DISTILLA	840.	0	0.31	0.34	0.33
44 GTR316 GT-60RE-16 POWR	0.	442.	978.	326.	332.	97.	730.	0.	1708.	DISTILLA	1708.	0	0.21	0.19	0.55
44 GTR316 GT-60RE-16 HEAT	0.	1283.	2838.	947.	962.	282.	0.	-1970.	2838.	DISTILLA	868.	0	0.31	0.34	0.33
45 FCPADS FUEL-CL-PH POWR	0.	338.	873.	148.	332.	97.	940.	0.	1812.	DISTILLA	1812.	0	0.16	0.18	0.52
45 FCPADS FUEL-CL-PH HEAT	0.	2159.	5571.	947.	2117.	620.	0.	-5579.	5571.	DISTILLA	-8.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	452.	805.	188.	332.	97.	893.	0.	1698.	DISTILLA	1698.	0	0.21	0.20	0.56
46 FCMCDS FUEL-CL-MO HEAT	0.	2283.	4064.	947.	1675.	491.	0.	-4196.	4064.	DISTILLA	-132.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28121 MW 120.00 PROCESS MILLIONS BTU/HR 265.0 PROCESS TEMP(F) 338. PRODUCT CHLORINE-CAU HOURS PER YEAR 8500.

POWER TO HEAT RATIO 1.545

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	312.	1280.	312.	COAL-FGD	1591.	0	0.	0.26	0.17
1	STM141	STM-TURB-1	POWR	0.	-937.	2528.	1740.	409.	120.	-1735.	0.	2528	RESIDUAL	2528.	0	-0.59	0.16	0.10
1	STM141	STM-TURB-1	HEAT	0.	122.	385.	265.	62.	18.	0.	1085.	385.	RESIDUAL	1470.	0	0.08	0.04	0.18
1	STM141	STM-TURB-1	POWR	0.	-937.	2528.	1740.	409.	120.	-1735.	0.	2528.	COAL-FGD	2528.	0	-0.59	0.16	0.10
1	STM141	STM-TURB-1	HEAT	0.	122.	385.	265.	62.	18.	0.	1085.	385.	COAL-FGD	1470.	0	0.08	0.04	0.18
1	STM141	STM-TURB-1	POWR	0.	-937.	2528.	1740.	409.	120.	-1735.	0.	2528.	COAL-AFB	2528.	0	-0.59	0.13	0.10
1	STM141	STM-TURB-1	HEAT	0.	122.	385.	265.	62.	18.	0.	1085.	385.	COAL-AFB	1470.	0	0.08	0.04	0.18
2	STM088	STM-TURB-8	POWR	0.	-1614.	3205.	2315.	409.	120.	-2412.	0.	3205.	RESIDUAL	3205.	0	-1.01	0.13	0.08
2	STM088	STM-TURB-8	HEAT	0.	91.	367.	265.	47.	14.	0.	1133.	367.	RESIDUAL	1500.	0	0.06	0.03	0.18
2	STM088	STM-TURB-8	POWR	0.	-1614.	3205.	2315.	409.	120.	-2412.	0.	3205.	COAL-FGD	3205.	0	-1.01	0.13	0.08
2	STM088	STM-TURB-8	HEAT	0.	91.	367.	265.	47.	14.	0.	1133.	367.	COAL-FGD	1500.	0	0.06	0.03	0.18
2	STM088	STM-TURB-8	POWR	0.	-1614.	3205.	2315.	409.	120.	-2412.	0.	3205.	COAL-AFB	3205.	0	-1.01	0.13	0.08
2	STM088	STM-TURB-8	HEAT	0.	91.	367.	265.	47.	14.	0.	1133.	367.	COAL-AFB	1500.	0	0.06	0.03	0.18
3	PFBSTM	PFB-STMTB-	POWR	0.	-219.	1810.	1118.	409.	120.	-1004.	0.	1810.	COAL-PFB	1810.	0	-0.14	0.23	0.15
3	PFBSTM	PFB-STMTB-	HEAT	0.	186.	429.	265.	97.	28.	0.	976.	429.	COAL-PFB	1405.	0	0.12	0.07	0.19
4	TISTMT	TI-STMTB-1	POWR	0.	99.	1492.	848.	409.	120.	-686.	0.	1492.	RESIDUAL	1492.	0	0.06	0.27	0.18
4	TISTMT	TI-STMTB-1	HEAT	0.	245.	466.	265.	128.	37.	0.	880.	466.	RESIDUAL	1346.	0	0.15	0.10	0.20
4	TISTMT	TI-STMTB-1	POWR	0.	99.	1492.	848.	409.	120.	-686.	0.	1492.	COAL	1492.	0	0.06	0.27	0.18
4	TISTMT	TI-STMTB-1	HEAT	0.	245.	466.	265.	128.	37.	0.	880.	466.	COAL	1346.	0	0.15	0.10	0.20
5	TIHRSG	THERMIONIC	POWR	0.	-1319.	2910.	1905.	409.	120.	-1930.	0.	2910.	RESIDUAL	2910.	0	-0.83	0.14	0.09
5	TIHRSG	THERMIONIC	HEAT	0.	85.	405.	265.	57.	17.	0.	1102.	405.	RESIDUAL	1506.	0	0.05	0.04	0.18
5	TIHRSG	THERMIONIC	POWR	0.	-1319.	2910.	1905.	409.	120.	-1930.	0.	2910.	COAL	2910.	0	-0.83	0.14	0.09
5	TIHRSG	THERMIONIC	HEAT	0.	85.	405.	265.	57.	17.	0.	1102.	405.	COAL	1506.	0	0.05	0.04	0.18
6	STIRL	STIRLING-1	POWR	0.	7.	1584.	746.	409.	120.	-565.	0.	1584.	DISTILLA	1584.	0	0.00	0.26	0.17
6	STIRL	STIRLING-1	HEAT	0.	203.	563.	265.	146.	43.	0.	825.	563.	DISTILLA	1388.	0	0.13	0.10	0.19

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28121 MW 120.00 PROCESS MILLIONS BTU/HR 265.0 PROCESS TEMP(F) 338. PRODUCT CHLORINE-CAU HOURS PER YEAR 8500.

POWER TO HEAT RATIO 1.545

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	7.	1584.	746.	409.	120.	-565.	0.	1584.	RESIDUAL	1584.	0	0.00	0.26	0.17
6	STIRL	STIRLING-1	HEAT	0.	203.	563.	265.	146.	43.	0.	825.	563.	RESIDUAL	1388.	0	0.13	0.10	0.19
6	STIRL	STIRLING-1	POWR	0.	7.	1584.	746.	409.	120.	-565.	0.	1584.	COAL	1584.	0	0.00	0.26	0.17
6	STIRL	STIRLING-1	HEAT	0.	203.	563.	265.	146.	43.	0.	825.	563.	COAL	1388.	0	0.13	0.10	0.19
7	HEGT85	HELIUM-GT-	POWR	0.	243.	1276.	203.	409.	120.	72.	0.	1348.	COAL-AFB	1348.	0	0.15	0.30	0.20
7	HEGT85	HELIUM-GT-	HEAT	0.	317.	1661.	265.	533.	156.	0.	-387.	1661.	COAL-AFB	1274.	0	0.16	0.32	0.16
8	HEGT60	HELIUM-GT-	POWR	0.	10.	1581.	500.	409.	120.	-276.	0.	1581.	COAL-AFB	1581.	0	0.01	0.26	0.17
8	HEGT60	HELIUM-GT-	HEAT	0.	152.	839.	265.	217.	64.	0.	601.	839.	COAL-AFB	1439.	0	0.10	0.15	0.18
9	HEGT00	HELIUM-GT-	POWR	0.	-735.	2326.	1152.	409.	120.	-1043.	0.	2326.	COAL-AFB	2326.	0	-0.46	0.18	0.11
9	HEGT00	HELIUM-GT-	HEAT	0.	71.	535.	265.	94.	28.	0.	985.	535.	COAL-AFB	1520.	10	0.04	0.06	0.17
10	FCMCCL	FUEL-CL-MO	POWR	0.	244.	1347.	638.	409.	120.	-439.	0.	1347.	COAL	1347.	0	0.15	0.30	0.20
10	FCMCCL	FUEL-CL-MO	HEAT	0.	284.	559.	265.	170.	50.	0.	748.	559.	COAL	1307.	10	0.18	0.13	0.20
11	FCSTCL	FUEL-CL-ST	POWR	0.	552.	1040.	401.	409.	120.	-159.	0.	1040.	COAL	1040.	10	0.35	0.39	0.25
11	FCSTCL	FUEL-CL-ST	HEAT	0.	470.	688.	265.	271.	79.	0.	433.	688.	COAL	1121.	10	0.30	0.24	0.24
12	IGGTST	INT-GAS-GT	POWR	0.	212.	1380.	570.	409.	120.	-359.	0.	1380.	COAL	1380.	0	0.13	0.30	0.19
12	IGGTST	INT-GAS-GT	HEAT	0.	265.	641.	265.	190.	56.	0.	685.	641.	COAL	1326.	10	0.17	0.14	0.20
13	GTSOAR	GT-HRSG-10	POWR	0.	179.	1412.	610.	409.	120.	-406.	0.	1412.	RESIDUAL	1412.	0	0.11	0.29	0.19
13	GTSOAR	GT-HRSG-10	HEAT	0.	254.	613.	265.	178.	52.	0.	724.	613.	RESIDUAL	1337.	0	0.16	0.13	0.20
14	GTAC08	GT-HRSG-08	POWR	0.	75.	1516.	779.	409.	120.	-604.	0.	1516.	RESIDUAL	1516.	0	0.05	0.27	0.17
14	GTAC08	GT-HRSG-08	HEAT	0.	231.	516.	265.	139.	41.	0.	844.	516.	RESIDUAL	1360.	0	0.15	0.10	0.19
15	GTAC12	GT-HRSG-12	POWR	0.	249.	1342.	625.	409.	120.	-423.	0.	1342.	RESIDUAL	1342.	0	0.16	0.31	0.20
15	GTAC12	GT-HRSG-12	HEAT	0.	285.	569.	265.	174.	51.	0.	737.	569.	RESIDUAL	1306.	0	0.18	0.13	0.20
16	GTAC16	GT-HRSG-16	POWR	0.	324.	1268	553.	409.	120.	-338.	0.	1268.	RESIDUAL	1268.	0	0.20	0.32	0.21
16	GTAC16	GT-HRSG-16	HEAT	0.	317.	608.	265.	196.	58.	0.	666.	608.	RESIDUAL	1274.	0	0.20	0.15	0.21
17	GTWC16	GT-HRSG-16	POWR	0.	291.	1300.	526.	409.	120.	-307.	0.	1300.	RESIDUAL	1300.	0	0.18	0.32	0.20
17	GTWC16	GT-HRSG-16	HEAT	0.	302.	655.	265.	206.	61.	0.	634.	655.	RESIDUAL	1290.	0	0.19	0.16	0.21

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28121 MW 120.00 PROCESS MILLIONS BTU/HR 265.0 PROCESS TEMP(F) 338. PRODUCT CHLORINE-CAU HOURS PER YEAR 8500.

POWER TO HEAT RATIO 1.545

UTILITY FUEL COAL — WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626	GTST-16/26	POWR	0.	531.	1060.	319.	409.	120.	-64.	0.	1060.	RESIDUAL	1060.	0	0.33	0.39	0.25
18 CC1626	GTST-16/26	HEAT	0.	494.	879.	265.	340.	100.	0.	218.	879.	RESIDUAL	1098.	0	0.31	0.31	0.24
19 CC1622	GTST-16/22	POWR	0.	518.	1073.	355.	409.	120.	-106.	0.	1073.	RESIDUAL	1073.	0	0.33	0.38	0.25
19 CC1622	GTST-16/22	HEAT	0.	466.	801.	265.	306.	90.	0.	324.	801.	RESIDUAL	1125.	0	0.29	0.27	0.24
20 CC1222	GTST-12/22	POWR	0.	523.	1069.	356.	409.	120.	-107.	0.	1069.	RESIDUAL	1069.	0	0.33	0.38	0.25
20 CC1222	GTST-12/22	HEAT	0.	469.	795.	265.	305.	89.	0.	327.	795.	RESIDUAL	1123.	0	0.29	0.27	0.24
21 CC0822	GTST-08/22	POWR	0.	462.	1129.	445.	409.	120.	-212.	0.	1129.	RESIDUAL	1129.	0	0.29	0.36	0.23
21 CC0822	GTST-08/22	HEAT	0.	401.	672.	265.	244.	71.	0.	518.	672.	RESIDUAL	1190.	0	0.25	0.20	0.22
22 STIG15	STIG-15-16	POWR	0.	221.	1075.	14.	409.	120.	295.	0.	1370.	RESIDUAL	1370.	0	0.14	0.30	0.19
22 STIG15	STIG-15-16	HEAT	0.	4198.	20385.	265.	7767.	2276.	0.	-22991.	20385.	RESIDUAL	-2606.	0	0.17	0.38	0.01
23 STIG10	STIG-10-16	POWR	0.	317.	1140.	151.	409.	120.	134.	0.	1274.	RESIDUAL	1274.	0	0.20	0.32	0.21
23 STIG10	STIG-10-16	HEAT	0.	556.	2000.	265.	718.	210.	0.	-965.	2000.	RESIDUAL	1035.	0	0.22	0.36	0.13
24 STIG1S	STIG-1S-16	POWR	0.	361.	1221.	257.	409.	120.	9.	0.	1230.	RESIDUAL	1230.	0	0.23	0.33	0.22
24 STIG1S	STIG-1S-16	HEAT	0.	371.	1257.	265.	421.	124.	0.	-37.	1257.	RESIDUAL	1220.	0	0.23	0.34	0.21
25 DEADV3	DIESEL-ADV	POWR	0.	457.	1104.	239.	409.	120.	30.	0.	1134.	RESIDUAL	1134.	0	0.29	0.36	0.23
25 DEADV3	DIESEL-ADV	HEAT	0.	507.	1222.	265.	453.	133.	0.	-137.	1222.	RESIDUAL	1085.	0	0.29	0.37	0.22
26 DEADV2	DIESEL-ADV	POWR	0.	488.	1104.	280.	409.	120.	-18.	0.	1104.	RESIDUAL	1104.	1	0.31	0.37	0.24
26 DEADV2	DIESEL-ADV	HEAT	0.	478.	1043.	265.	387.	113.	0.	70.	1043.	RESIDUAL	1113.	1	0.30	0.35	0.24
27 DEADV1	DIESEL-ADV	POWR	0.	488.	1104.	432.	409.	120.	-196.	0.	1104.	RESIDUAL	1104.	1	0.31	0.37	0.24
27 DEADV1	DIESEL-ADV	HEAT	0.	420.	678.	265.	251.	74.	0.	494.	678.	RESIDUAL	1171.	1	0.26	0.21	0.23
28 DEHTPM	ADV-DIESEL	POWR	0.	378.	1213.	522.	409.	120.	-302.	0.	1213.	RESIDUAL	1213.	0	0.24	0.34	0.22
28 DEHTPM	ADV-DIESEL	HEAT	0.	345.	616.	265.	208.	61.	0.	630.	616.	RESIDUAL	1246.	0	0.22	0.17	0.21
29 DESOA3	DIESEL-SOA	POWR	0.	389.	1134.	207.	409.	120.	68.	0.	1202.	DISTILLA	1202.	0	0.24	0.34	0.22
29 DESOA3	DIESEL SOA	HEAT	0.	497.	1449.	265.	523.	153.	0.	-356.	1449.	DISTILLA	1094.	0	0.26	0.36	0.18
29 DESOA3	DIESEL-SOA	POWR	0.	389.	1134.	207.	409.	120.	68.	0.	1202.	RESIDUAL	1202.	0	0.24	0.34	0.22
29 DESOA3	DIESEL-SOA	HEAT	0.	497.	1449.	265.	523.	153.	0.	-356.	1449.	RESIDUAL	1094.	0	0.26	0.36	0.18

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28121 MW 120.00 PROCESS MILLIONS BTU/HR 265.0 PROCESS TEMP(F) 338. PRODUCT CHLORINE-CAU HOURS PER YEAR 8500.

POWER TO HEAT RATIO 1.545

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	439.	1134.	250.	409.	120.	18.	0.	1152.	DISTILLA	1152.	1	0.28	0.36	0.23
30 DESOA2 DIESEL-SOA HEAT	0.	466.	1205.	265.	435.	127.	0.	-79.	1205.	DISTILLA	1125.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	439.	1134.	250.	409.	120.	18.	0.	1152.	RESIDUAL	1152.	1	0.28	0.36	0.23
30 DESOA2 DIESEL-SOA HEAT	0.	466.	1205.	265.	435.	127.	0.	-79.	1205.	RESIDUAL	1125.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	457.	1134.	455.	409.	120.	-223.	0.	1134.	DISTILLA	1134.	1	0.29	0.36	0.23
31 DESOA1 DIESEL-SOA HEAT	0.	396.	661.	265.	239.	70.	0.	534.	661.	DISTILLA	1195.	1	0.25	0.20	0.22
31 DESOA1 DIESEL-SOA POWR	0.	457.	1134.	455.	409.	120.	-223.	0.	1134.	RESIDUAL	1134.	1	0.29	0.36	0.23
31 DESOA1 DIESEL-SOA HEAT	0.	396.	661.	265.	239.	70.	0.	534.	661.	RESIDUAL	1195.	1	0.25	0.20	0.22
32 GTSOAD GT-HRSG-10 POWR	0.	189.	1402.	650.	409.	120.	-453.	0.	1402.	DISTILLA	1402.	0	0.12	0.29	0.19
32 GTSOAD GT-HRSG-10 HEAT	0.	262.	572.	265.	167.	49.	0.	758.	572.	DISTILLA	1330.	0	0.16	0.13	0.20
33 GTRA08 GT-85RE-08 POWR	0.	444.	1147.	399.	409.	120.	-157.	0.	1147.	DISTILLA	1147.	0	0.28	0.36	0.23
33 GTRA08 GT-85RE-08 HEAT	0.	400.	762.	265.	272.	80.	0.	429.	762.	DISTILLA	1191.	0	0.25	0.23	0.22
34 GTRA12 GT-85RE-12 POWR	0.	448.	1144.	407.	409.	120.	-167.	0.	1144.	DISTILLA	1144.	0	0.28	0.36	0.23
34 GTRA12 GT-85RE-12 HEAT	0.	400.	745.	265.	267.	78.	0.	446.	745.	DISTILLA	1191.	0	0.25	0.22	0.22
35 GTRA16 GT-85RE-16 POWR	0.	418.	1173.	435.	409.	120.	-200.	0.	1173.	DISTILLA	1173.	0	0.26	0.35	0.23
35 GTRA16 GT-85RE-16 HEAT	0.	377.	715.	265.	249.	73.	0.	500.	715.	DISTILLA	1215.	0	0.24	0.21	0.22
36 GTR208 GT-60RE-08 POWR	0.	312.	1280.	523.	409.	120.	-304.	0.	1280.	DISTILLA	1280.	0	0.20	0.32	0.21
36 GTR208 GT-60RE-08 HEAT	0.	312.	648.	265.	207.	61.	0.	631.	648.	DISTILLA	1280.	0	0.20	0.16	0.21
37 GTR212 GT-60RE-12 POWR	0.	351.	1241.	488.	409.	120.	-262.	0.	1241.	DISTILLA	1241.	0	0.22	0.33	0.21
37 GTR212 GT-60RE-12 HEAT	0.	333.	674.	265.	223.	65.	0.	584.	674.	DISTILLA	1258.	0	0.21	0.18	0.21
38 GTR216 GT-60RE-16 POWR	0.	376.	1215.	476.	409.	120.	-248.	0.	1215.	DISTILLA	1215.	0	0.24	0.34	0.22
38 GTR216 GT-60RE-16 HEAT	0.	348.	676.	265.	228.	67.	0.	567.	676.	DISTILLA	1244.	0	0.22	0.18	0.21
39 GTRW08 GT-85RE-08 POWR	0.	425.	1166.	333.	409.	120.	-80.	0.	1166.	DISTILLA	1166.	0	0.27	0.35	0.23
39 GTRW08 GT-85RE-08 HEAT	0.	402.	927.	265.	325.	95.	0.	262.	927.	DISTILLA	1190.	0	0.25	0.27	0.22
40 GTRW12 GT-85RE-12 POWR	0.	466.	1125.	327.	409.	120.	-73.	0.	1125.	DISTILLA	1125.	0	0.29	0.36	0.24
40 GTRW12 GT-85RE-12 HEAT	0.	437.	912.	265.	332.	97.	0.	242.	912.	DISTILLA	1154.	0	0.27	0.29	0.23

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28121 MW 120.00 PROCESS MILLIONS BTU/HR 265.0 PROCESS TEMP(F) 338. PRODUCT CHLORINE-CAU HOURS PER YEAR 8500.

POWER TO HEAT RATIO 1.545

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	444.	1147.	351.	409.	120.	-102.	0.	1147.	DISTILLA	1147.	0	0.28	0.36	0.23
41 GTRW16 GT-85RE-16 HEAT	0.	412.	865.	265.	309.	90.	0.	315.	865.	DISTILLA	1180.	0	0.26	0.26	0.22
42 GTR308 GT-60RE-08 POWR	0.	270.	1321.	436.	409.	120.	-202.	0.	1321.	DISTILLA	1321.	0	0.17	0.31	0.20
42 GTR308 GT-60RE-08 HEAT	0.	287.	802.	265.	249.	73.	0.	503.	802.	DISTILLA	1305.	0	0.18	0.19	0.20
43 GTR312 GT-60RE-12 POWR	0.	394.	1197.	401.	409.	120.	-160.	0.	1197.	DISTILLA	1197.	C	0.25	0.34	0.22
43 GTR312 GT-60RE-12 HEAT	0.	366.	791.	265.	270.	79.	0.	434.	791.	DISTILLA	1225.	0	0.23	0.22	0.22
44 GTR316 GT-60RE-16 POWR	0.	383.	1208.	407.	409.	120.	-168.	0.	1208.	DISTILLA	1208.	0	0.24	0.34	0.22
44 GTR316 GT-60RE-16 HEAT	0.	358.	786.	265.	266.	78.	0.	447.	786.	DISTILLA	1233.	0	0.23	0.22	0.21
45 FCPADS FUEL-CL-PH POWR	0.	418.	1077.	183.	409.	120.	96.	0.	1174.	DISTILLA	1174.	0	0.26	0.35	0.23
45 FCPADS FUEL-CL-PH HEAT	0.	604.	1559.	265.	592.	174.	0.	-572.	1559.	DISTILLA	987.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	558.	994.	232.	409.	120.	39.	0.	1033.	DISTILLA	1033.	0	0.35	0.40	0.28
46 FCMCDS FUEL-CL-MO HEAT	0.	639.	1137.	265.	469.	137.	0.	-185.	1137.	DISTILLA	953.	0	0.36	0.41	0.23

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 2813: MW 34.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CRYOGENIC-O- HOURS PER YEAR -1.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	0	0.	0.32	0.
1 STM141 STM-TURB-1 POWR	0.	15.	347.	179.	116.	34.	-211.	0.	347.	RESIDUAL	347.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	15.	347.	179.	116.	34.	-211.	0.	347.	COAL-FGD	347.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL-FGD	363.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	15.	347.	179.	116.	34.	-211.	0.	347.	COAL-AFB	347.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL-AFB	363.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-20.	383.	209.	116.	34.	-246.	0.	383.	RESIDUAL	383.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-20.	383.	209.	116.	34.	-246.	0.	383.	COAL-FGD	383.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL-FGD	363.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-20.	383.	209.	116.	34.	-246.	0.	383.	COAL-AFB	383.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL-AFB	363.	111	0.	0.	0.
3 PFBSTM PFB-STMTB- POWR	0.	60.	303.	143.	116.	34.	-162.	0.	303.	COAL-PFB	303.	1	0.17	0.38	0.
3 PFBSTM PFB-STMTB- HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL-PFB	363.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	83.	280.	120.	116.	34.	-141.	0.	280.	RESIDUAL	280.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	83.	280.	120.	116.	34.	-141.	0.	280.	COAL	280.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL	363.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-462.	825.	583.	116.	34.	-686.	0.	825.	RESIDUAL	825.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-462.	825.	583.	116.	34.	-686.	0.	825.	COAL	825.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0	COAL	363.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-14.	377.	157.	116.	34.	-185.	0.	377	DISTILLA	377.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28131 MW 34.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CRYOGENIC-O- HOURS PER YEAR -1.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-14.	377.	137.	116.	34.	-185.	0.	377.	RESIDUAL	377.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-14.	377.	157.	116.	34.	-185.	0.	377.	COAL	377.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL	363.	111	0.	0.	0.
7 HEGT85 HELIUM-GT- POWR	0.	1.	361.	161.	116.	34.	-190.	0.	361.	CO[illegible]-AFB	361.	11	0.00	0.32	0.
7 HEGT85 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	CO[illegible]-AFB	363.	111	0.	0.	0.
8 HEGT60 HELIUM-GT- POWR	0.	-85.	448.	192.	116.	34.	-226.	0.	448.	COAL-AFB	448.	11	-0.24	0.26	0.
8 HEGT60 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL-AFB	363.	111	0.	0.	0.
9 HEGT00 HELIUM-GT- POWR	0.	-297.	659.	398.	116.	34.	-469.	0.	659.	COAL-AFB	659.	11	-0.82	0.18	0.
9 HEGT00 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL-AFB	363.	111	0.	0.	0.
10 FCMCCL FUEL-CL-MO POWR	0.	-19.	382.	183.	116.	34.	-215.	0.	382.	COAL	382.	11	-0.05	0.30	0.
10 FCMCCL FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL	363.	111	0.	0.	0.
11 FCSTCL FUEL-CL-ST POWR	0.	127.	236.	68.	116.	34.	-80.	0.	236.	COAL	236.	11	0.35	0.49	0.
11 FCSTCL FUEL-CL-ST HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL	363.	111	0.	0.	0.
12 IGGTST INT-GA[illegible]GT POWR	0.	73.	290.	90.	116.	34.	-106.	0.	290.	COAL	290.	11	0.20	0.40	0.
12 IGGTST INT-GA[illegible]GT HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	COAL	363.	111	0.	0.	0.
13 GTSOAR GT-HRSG-10 POWR	0.	-38.	400.	198.	116.	34.	-233.	0.	400.	RESIDUAL	400.	1	-0.10	0.29	0.
13 GTSOAR GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
14 GTAC08 GT-HRSG-08 POWR	0.	-67.	430.	206.	116.	34.	-243.	0.	430.	RESIDUAL	430.	1	-0.19	0.27	0.
14 GTAC08 GT-HRSG-08 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
15 GTAC12 GT-HRSG-12 POWR	0.	-18.	380.	196.	116.	34.	-231.	0.	380.	RESIDUAL	380.	1	-0.05	0.31	0.
15 GTAC12 GT-HRSG-12 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
16 GTAC16 GT-HRSG-16 POWR	0.	3.	359.	180.	116.	34.	-212.	0.	359.	RESIDUAL	359.	1	0.01	0.32	0.
16 GTAC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
17 GTWC16 GT-HRSG-16 POWR	0.	-6.	368.	147.	116.	34.	-173.	0.	368.	RESIDUAL	368.	1	-0.02	0.32	0.
17 GTWC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28131 MW 34.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CRYOGENIC-O- HOURS PER YEAR -1.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	111.	251.	57.	116.	34.	-67.	0.	251.	RESIDUAL	251.	1	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	111.	251.	63.	116.	34.	-74.	0.	251.	RESIDUAL	251.	1	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
20 CC1222 GTST-12/22 POWR	0.	114.	249.	62.	116.	34.	-73.	0.	249.	RESIDUAL	249.	1	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0	0.	0.	0.	363.	0.	RESIDUAL	363	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	111.	251.	74.	116.	34.	-87.	0.	251.	RESIDUAL	251.	1	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
22 STIG15 STIG-15-16 POWR	0.	58.	304.	4.	116.	34.	-5.	0.	304.	RESIDUAL	304.	1	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
23 STIG10 STIG-10-16 POWR	0.	39.	323.	43.	116.	34.	-50.	0.	323.	RESIDUAL	323.	1	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
24 STIG1S STIG-1S-16 POWR	0.	16.	346.	73.	116.	34.	-86.	0.	346.	RESIDUAL	346.	1	0.05	0.34	0.
24 STIG1S STIG-1S-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	50.	313.	113.	116.	34.	-132.	0.	313.	RESIDUAL	313.	1	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
26 DEADV2 DIESEL-ADV POWR	0.	50.	313.	79.	116.	34.	-93.	0.	313.	RESIDUAL	313.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
27 DEADV1 DIESEL-ADV POWR	0.	50.	313.	122.	116.	34.	-144.	0.	313.	RESIDUAL	313.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
28 DEHTPM ADV-DIESEL POWR	0.	73.	289.	147.	116.	34.	-173.	0.	289.	RESIDUAL	289.	1	0.20	0.40	0.
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	41.	321.	105.	116.	34.	-123.	0.	321.	DISTILLA	321.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	41.	321.	105.	116.	34.	-123.	0.	321.	RESIDUAL	321.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28131 MW 34.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CRYOGENIC-0- HOURS PER YEAR -1.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	41.	321.	71.	116.	34.	-83.	0.	321.	DISTILLA	321.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
30 DESOA2 DIESEL-SOA POWR	0.	41.	321.	71.	116.	34.	-83.	0.	321.	RESIDUAL	321.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	41.	321.	129.	116.	34.	-152.	0.	321.	DISTILLA	321.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	41.	321.	129.	116.	34.	-152.	0.	321.	RESIDUAL	321.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	RESIDUAL	363.	111	0.	0.	0.
32 GTSOAD GT-HRSG-10 POWR	0.	-35.	397.	214.	116.	34.	-252.	0.	397.	DISTILLA	397.	1	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
33 GTRA08 GT-85RE-08 POWR	0.	38.	325.	131.	116.	34.	-154.	0.	325.	DISTILLA	325.	1	0.10	0.36	0.
33 GTRA08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
34 GTRA12 GT-85RE-12 POWR	0.	38.	324.	133.	116.	34.	-156.	0.	324.	DISTILLA	324.	1	0.11	0.36	0.
34 GTRA12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
35 GTRA16 GT-85RE-16 POWR	0.	30.	332.	141.	116.	34.	-166.	0.	332.	DISTILLA	332.	1	0.08	0.35	0.
35 GTRA16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	363.	171.	116.	34.	-201.	0.	363.	DISTILLA	363.	1	0.	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
37 GTR212 GT-60RE-12 POWR	0.	11.	352.	157.	116.	34.	-185.	0.	352.	DISTILLA	352.	1	0.03	0.33	0.
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
38 GTR216 GT-60RE-16 POWR	0.	18.	344.	154.	116.	34.	-181.	0.	344.	DISTILLA	344.	1	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
39 GTRW08 GT-85RE-08 POWR	0.	32.	331.	109.	116.	34.	-128.	0.	331.	DISTILLA	331.	1	0.09	0.35	0.
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
40 GTRW12 GT-85RE-12 POWR	0.	44.	319.	106.	116.	34.	-125.	0.	319.	DISTILLA	319.	1	0.12	0.36	0.
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28131 MW 34.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CRYOGENIC-0- HOURS PER YEAR -1.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	38.	325.	114.	116.	34.	-134.	0.	325.	DISTILLA	325.	1	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
42 GTR308 GT-60RE-08 POWR	0.	-12.	374.	168.	116.	34.	-198.	0.	374.	DISTILLA	374.	1	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	23.	339.	129.	116.	34.	-152.	0.	339.	DISTILLA	339.	1	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	20.	342.	132.	116.	34.	-155.	0.	342.	DISTILLA	342.	1	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	57.	305.	52.	116.	34.	-61.	0.	305.	DISTILLA	305.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	81.	282.	66.	116.	34.	-77.	0.	282.	DISTILLA	282.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	363.	0.	DISTILLA	363.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28191 MW 30.29 PROCESS MILLIONS BTU/HR 980.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	1153.	323.	1153.	COAL-FGD	1476.	0	0.	0.07	0.66
1	STM141	STM-TURB-1	POWR	0.	201.	1133.	860.	103.	30.	141.	0.	1275.	RESIDUAL	1275.	0	0.14	0.08	0.77
1	STM141	STM-TURB-1	HEAT	0.	229.	1291.	980.	118.	35.	0.	-45.	1291.	RESIDUAL	1246.	0	0.15	0.03	0.76
1	STM141	STM-TURB-1	POWR	0.	201.	1133.	860.	103.	30.	141.	0.	1275.	COAL-FGD	1275.	0	0.14	0.08	0.77
1	STM141	STM-TURB-1	HEAT	0.	229.	1291.	980.	118.	35.	0.	-45.	1291.	COAL-FGD	1246.	0	0.15	0.09	0.76
1	STM141	STM-TURB-1	POWR	0.	201.	1133.	860.	103.	30.	141.	0.	1275.	COAL-AFB	1275.	0	0.14	0.08	0.77
1	STM141	STM-TURB-1	HEAT	0.	229.	1291.	980.	118.	35.	0.	-45.	1291.	COAL-AFB	1246.	0	0.15	0.09	0.76
2	STM088	STM-TURB-8	POWR	0.	-397.	1873.	1489.	103.	30.	-598.	0.	1873.	RESIDUAL	1873.	0	-0.27	0.06	0.52
2	STM088	STM-TURB-8	HEAT	0.	133.	1233.	980.	68.	20.	0.	110.	1233.	RESIDUAL	1343.	0	0.09	0.05	0.73
2	STM088	STM-TURB-8	POWR	0.	-397.	1873.	1489.	103.	30.	-598.	0.	1873.	COAL-FGD	1873.	0	-0.27	0.06	0.52
2	STM088	STM-TURB-8	HEAT	0.	133.	1233.	980.	68.	20.	0.	110.	1233.	COAL-FGD	1343.	0	0.09	0.05	0.73
2	STM088	STM-TURB-8	POWR	0.	-397.	1873.	1489.	103.	30.	-598.	0.	1873.	COAL-AFB	1873.	0	-0.27	0.06	0.52
2	STM088	STM-TURB-8	HEAT	0.	133.	1233.	980.	68.	20.	0.	110.	1233.	COAL-AFB	1343.	0	0.09	0.05	0.73
3	PFBSTM	PFB-STMTB-	POWR	0.	193.	630.	425.	103.	30.	653.	0.	1283.	COAL-PFB	1283.	0	0.13	0.08	0.76
3	PFBSTM	PFB-STMTB-	HEAT	0.	445.	1452.	980.	238.	70.	0.	-422.	1452.	COAL-PFB	1030.	0	0.23	0.16	0.67
4	TISTMT	TI-STMTB-1	POWR	0.	197.	480.	301.	103.	30.	799.	0.	1278.	RESIDUAL	1278.	0	0.13	0.08	0.77
4	TISTMT	TI-STMTB-1	HEAT	0.	642.	1561.	980.	336.	99.	0.	-728.	1561.	RESIDUAL	834.	0	0.29	0.22	0.63
4	TISTMT	TI-STMTB-1	POWR	0.	197.	480.	301.	103.	30.	799.	0.	1278.	COAL	1278.	0	0.13	0.08	0.77
4	TISTMT	TI-STMTB-1	HEAT	0.	642.	1561.	980.	336.	99.	0.	-728.	1561.	COAL	834.	0	0.29	0.22	0.63
5	TIHRSG	THERMIONIC	POWR	0.	103.	735.	437.	103.	30.	639.	0.	1373.	RESIDUAL	1373.	0	0.07	0.06	0.71
5	TIHRSG	THERMIONIC	HEAT	0.	230.	1647.	980.	232.	68.	0.	-401.	1647.	RESIDUAL	1246.	0	0.12	0.14	0.60
5	TIHRSG	THERMIONIC	POWR	0.	103.	735.	437.	103.	30.	639.	0.	1373.	COAL	1373.	0	0.07	0.08	0.71
5	TIHRSG	THERMIONIC	HEAT	0.	230.	1647.	980.	232.	68.	0.	-401.	1647.	COAL	1246.	0	0.12	0.14	0.60
6	STIRL	STIRLING-1	POWR	0.	133.	476.	243.	103.	30.	867.	0.	1343.	DISTILLA	1343.	0	0.09	0.06	0.73
6	STIRL	STIRLING-1	HEAT	0.	537.	1917.	980.	416.	122.	0.	-979.	1917.	DISTILLA	938.	0	0.22	0.22	0.51

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28191 MW 30.29 PROCESS MILLIONS BTU/HR 980.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	133.	476.	243.	103.	30.	867.	0.	1343.	RESIDUAL	1343.	0	0.09	0.08	0.73
6 STIRL	STIRLING-1	HEAT	0.	537.	1917.	980.	416.	122.	0.	-979.	1917.	RESIDUAL	938.	0	0.22	0.22	0.51
6 STIRL	STIRLING-1	POWR	0.	133.	476.	243.	103.	30.	867.	0.	1343.	COAL	1343.	0	0.09	0.08	0.73
6 STIRL	STIRLING-1	HEAT	0.	537.	1917.	980.	416.	122.	0.	-979.	1917.	COAL	938.	0	0.22	0.22	0.51
7 HEGT85	HELIUM-GT-	POWR	0.	-39.	322.	-34.	103.	30.	1193.	0	1515.	COAL-AFB	1515.	11	-0.03	0.07	0.65
7 HEGT85	HELIUM-GT-	HEAT	-9206.	1124.	-9206.	980.	-2955.	-866.	0.	9558.	-9206.	COAL-AFB	352.	11	-5.48	-8.40	2.79
8 HEGT60	HELIUM-GT-	POWR	0.	-9.	399.	57.	103.	30.	1086.	0.	1485.	COAL-AFB	1485.	10	-0.01	0.07	0.66
8 HEGT60	HELIUM-GT-	HEAT	0.	-163.	6901.	980.	1787.	524.	0.	-5263.	6901.	COAL-AFB	1638.	0	-0.02	0.26	0.14
9 HEGT00	HELIUM-GT-	POWR	0.	55.	587.	271.	103.	30.	834.	0.	1421.	COAL-AFB	1421.	10	0.04	0.07	0.69
9 HEGT00	HELIUM-GT-	HEAT	0.	198.	2121.	980.	373.	109.	0.	-844.	2121.	COAL-AFB	1277.	0	0.09	0.18	0.46
10 FCMCCL	FUEL-CL-MO	POWR	0.	171.	340.	160.	103.	30.	965.	0.	1305.	COAL	1305.	10	0.12	0.08	0.75
10 FCMCCL	FUEL-CL-MO	HEAT	0.	1049.	2085.	980.	634.	186.	0.	-1658.	2085.	COAL	427.	0	0.33	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	177.	291.	123.	103.	30.	1008.	0.	1299.	COAL	1299.	10	0.12	0.08	0.75
11 FCSTCL	FUEL-CL-ST	HEAT	0.	1406.	2311.	980.	821.	241.	0.	-2242.	2311.	COAL	70.	0	0.38	0.36	0.42
12 IGGTST	INT-GAS-GT	POWR	0.	134.	406.	185.	103.	30.	935.	0.	1341.	COAL	1341.	10	0.03	0.08	0.73
12 IGGTST	INT-GAS-GT	HEAT	0.	712.	2151.	980.	547.	160.	0.	-1387.	2151.	COAL	764.	0	0.25	0.25	0.46
13 GTSOAR	GT-HRSG-10	POWR	0.	126.	356.	136.	103.	30.	994.	0.	1350.	RESIDUAL	1350.	0	0.09	0.08	0.73
13 GTSOAR	GT-HRSG-10	HEAT	0.	911.	2577.	980.	747.	219.	0.	-2013.	2577.	RESIDUAL	565.	0	0.26	0.23	0.38
14 GTAC08	GT-HRSG-08	POWR	0.	172.	383.	197.	103.	30.	921.	0.	1303.	RESIDUAL	1303.	0	0.12	0.08	0.75
14 GTAC08	GT-HRSG-08	HEAT	0.	856.	1900.	980.	513.	150.	0.	-1280.	1900.	RESIDUAL	620.	0	0.31	0.27	0.52
15 GTAC12	GT-HRSG-12	POWR	0.	169.	339.	157.	103.	30.	968.	0.	1307.	RESIDUAL	1307.	0	0.11	0.08	0.75
15 GTAC12	GT-HRSG-12	HEAT	0.	1054.	2114.	980.	645.	189.	0.	-1692.	2114.	RESIDUAL	422.	0	0.33	0.31	0.46
16 GTAC16	GT-HRSG-16	POWR	0.	161.	320.	134.	103.	30.	995.	0.	1315.	RESIDUAL	1315.	0	0.11	0.08	0.75
16 GTAC16	GT-HRSG-16	HEAT	0.	1175	2332.	980.	753.	221.	0.	-2031.	2332.	RESIDUAL	301.	0	0.33	0.32	0.42
17 GTWC16	GT-HRSG-16	POWR	0.	151.	328.	133.	103.	30.	996.	0.	1324.	RESIDUAL	1324.	0	0.10	0.08	0.74
17 GTWC16	GT-HRSG-16	HEAT	0.	1115.	2416.	980.	761.	223.	0.	-2055.	2416.	RESIDUAL	361.	0	0.32	0.32	0.41

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28191 MW 30.29 PROCESS MILLIONS BTU/HR 980.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	146.	291.	97.	103.	30.	1039.	0.	1330.	RESIDUAL	1330.	0	0.10	0.08	0.74
18 CC1626 GTST-16/26 HEAT	0.	1478.	2949.	980.	1047.	307.	0.	-2950.	2949.	RESIDUAL	-2.	0	0.33	0.36	0.33
19 CC1622 GTST-16/22 POWR	0.	153.	297.	108.	103.	30.	1026.	0.	1323.	RESIDUAL	1323.	0	0.10	0.08	0.74
19 CC1622 GTST-16/22 HEAT	0.	1392.	2693.	980.	938.	275.	0.	-2609.	2693.	RESIDUAL	84.	0	0.34	0.35	0.36
20 CC1222 GTST-12/22 POWR	0.	155.	296.	109.	103.	30.	1025.	0.	1321.	RESIDUAL	1321.	0	0.10	0.08	0.74
20 CC1222 GTST-12/22 HEAT	0.	1394.	2667.	980.	930.	273.	0.	-2584.	2667.	RESIDUAL	82.	0	0.34	0.35	0.37
21 CC0822 GTST-08/22 POWR		166.	321.	140.	103.	30.	989.	0.	1310.	RESIDUAL	1310.	0	0.11	0.08	0.75
21 CC0822 GTST-08/22 HEAT		1168.	2253.	980.	726.	213.	0.	-1945.	2253.	RESIDUAL	308.	0	0.34	0.32	0.43
22 STIG15 STIG-15-16 POWR	0.	56.	271.	4.	103.	30.	1149.	0.	1420.	RESIDUAL	1420.	1	0.04	0.07	0.69
22 STIG15 STIG-15-16 HEAT	0.	15523.	75385.	980.	28722.	8418.	0.	-89432.	75385.	RESIDUAL	-14047.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	80.	288.	38.	103.	30.	1108.	0.	1396.	RESIDUAL	1396.	1	0.03	0.07	0.70
23 STIG10 STIG-10-16 HEAT	0.	2057.	7396.	980.	2656.	778.	0.	-7977.	7396.	RESIDUAL	-581.	1	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	91.	308.	65.	103.	30.	1076.	0.	1385.	RESIDUAL	1385.	1	0.06	0.07	0.71
24 STIG1S STIG-1S-16 HEAT	0.	1374.	4649.	980.	1558.	457.	0.	-4547.	4649.	RESIDUAL	102.	1	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	94.	279.	42.	103.	30.	1104.	0.	1382.	RESIDUAL	1382.	1	0.06	0.07	0.71
25 DEADV3 DIESEL-ADV HEAT	0.	2191.	6515.	980.	2417.	708.	0.	-7231.	6515.	RESIDUAL	-715.	1	0.25	0.37	0.15
26 DEADV2 DIESEL-ADV POWR	0.	128.	279.	71.	103.	30.	1070.	0.	1348.	RESIDUAL	1348.	1	0.09	0.08	0.73
26 DEADV2 DIESEL-ADV HEAT	0.	1768.	3858.	980.	1431.	420.	0.	-4150.	3658.	RESIDUAL	-292.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	173.	279.	109.	103.	30.	1025.	0.	1303.	RESIDUAL	1303.	1	0.12	0.08	0.75
27 DEADV1 DIESEL-ADV HEAT	0.	1552.	2506.	980.	930.	273.	0.	-2583.	2506.	RESIDUAL	-76.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	134.	384.	166.	103.	30.	958.	0.	1342.	RESIDUAL	1342.	0	0.09	0.08	0.73
28 DEHTPM ADV-DIESEL HEAT	0.	791.	2269.	980.	610.	179.	0.	-1584.	2269.	RESIDUAL	685.	0	0.26	0.27	0.43
29 DESOA3 DIESEL-SOA POWR	0.	76.	286.	33.	103.	30.	1114.	0.	1400.	DISTILLA	1400.	1	0.05	0.07	0.70
29 DESOA3 DIESEL-SOA HEAT	0.	2232.	8418.	980.	3039.	891.	0.	-9174.	8418.	DISTILLA	-756.	1	0.21	0.36	0.12
29 DESOA3 DIESEL-SOA POWR	0.	76.	286.	33.	103.	30.	1114.	0.	1400.	RESIDUAL	1400.	1	0.05	0.07	0.70
29 DESOA3 DIESEL-SOA HEAT	0.	2232.	8418.	980.	3039.	891.	0.	-9174.	8418.	RESIDUAL	-756.	1	0.21	0.36	0.12

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28191 MW 30.29 PROCESS MILLIONS BTU/HR 980.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	111.	286.	63.	103.	30.	1079.	0.	1365.	DISTILLA	1365.	1	0.08	0.08	0.72
30	DESOA2	DIESEL-SOA	HEAT	0.	1724.	4455.	980.	1608.	471.	0.	-4702.	4455.	DISTILLA	-248.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	111.	286.	63.	103.	30.	1079.	0.	1365.	RESIDUAL	1365.	1	0.08	0.08	0.72
30	DESOA2	DIESEL-SOA	HEAT	0.	1724.	4455.	980.	1608.	471.	0.	-4702.	4455.	RESIDUAL	-248.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	172.	286.	115.	103.	30.	1018.	0.	1304.	DISTILLA	1304.	1	0.12	0.08	0.75
31	DESOA1	DIESEL-SOA	HEAT	0.	1466.	2444.	980.	882.	259.	0.	-2434.	2444.	DISTILLA	10.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	172.	286.	115.	103.	30.	1018.	0.	1304.	RESIDUAL	1304.	1	0.12	0.08	0.75
31	DESOA1	DIESEL-SOA	HEAT	0.	1466.	2444.	980.	882.	259.	0.	-2434.	[illegible]	RESIDUAL	10.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	158.	354.	160.	103.	30.	964.	0.	[illegible]	[illegible]STILLA	1318.	0	0.11	0.08	0.74
32	GTSOAD	GT-HRSG-10	HEAT	0.	964.	2162.	980.	631.	185.	0.	-1650.	[illegible]	[illegible]STILLA	512.	0	0.31	0.29	0.45
33	GTRA08	GT-85RE-08	POWR	0.	126.	289.	76.	103.	30.	1061.	0.	[illegible]	DISTILLA	1350.	0	0.09	0.08	0.73
33	GTRA08	GT-85RE-08	HEAT	0.	1572.	3622.	980.	1293.	379.	0.	-3718.	3622.	DISTILLA	-96.	0	0.30	0.36	0.27
34	GTRA12	GT-85RE-12	POWR	0.	133.	289.	84.	103.	30.	1054.	0.	1343.	DISTILLA	1343.	0	0.09	0.08	0.73
34	GTRA12	GT-85RE-12	HEAT	0.	1552.	3360.	980.	1203.	353.	0.	-3436.	3360.	DISTILLA	-76.	0	0.32	0.36	0.29
35	GTRA16	GT-85RE-16	POWR	0.	137.	296.	94.	103.	30.	1043.	0.	1339.	DISTILLA	1339.	0	0.09	0.08	0.73
35	GTRA16	GT-85RE-16	HEAT	0.	1434.	3103.	980.	1083.	317.	0.	-3061.	3103.	DISTILLA	42.	0	0.32	0.35	0.32
36	GTR208	GT-60RE-08	POWR	0.	140.	323.	119.	103.	30.	1013.	0.	1336.	DISTILLA	1336.	0	0.09	0.08	0.73
36	GTR208	GT-60RE-08	HEAT	0.	1153.	2660.	980.	851.	250.	0.	-2337.	2660.	DISTILLA	323.	0	0.30	0.32	0.37
37	GTR212	GT-60RE-12	POWR	0.	140.	313.	111.	103.	30.	1023.	0.	1336.	DISTILLA	1336.	0	0.09	0.08	0.73
37	GTR212	GT-60RE-12	HEAT	0.	1240.	2772.	980.	915.	268.	0.	-2535.	2772.	DISTILLA	236.	0	0.31	0.33	0.35
38	GTR216	GT-60RE-16	POWR	0.	143.	307.	107.	103.	30.	1027.	0.	1333.	DISTILLA	1333.	0	0.10	0.08	0.73
38	GTR216	GT-60RE-16	HEAT	0.	1302.	2801.	980.	944.	277.	0.	-2627.	2801.	DISTILLA	174.	0	0.32	0.34	0.35
39	GTRW08	GT-85RE-08	POWR	0.	108.	294.	68.	103.	30.	1074.	0.	1368.	DISTILLA	1368.	0	0.07	0.08	0.72
39	GTRW08	GT-85RE-08	HEAT	0.	1567.	4275.	980.	1500.	440.	0.	-4366.	4275.	DISTILLA	-91.	0	0.27	0.35	0.23
40	GTRW12	GT-85RE-12	POWR	0.	121.	284.	69.	103.	30.	1071.	0.	1355.	DISTILLA	1355.	0	0.08	0.08	0.72
40	GTRW12	GT-85RE-12	HEAT	0.	1705.	4012.	980.	1460.	428.	0.	-4240.	4012.	DISTILLA	-229	0	0.30	0.36	0.24

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28191 MW 30.29 PROCESS MILLIONS BTU/HR 980.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	125.	289.	78.	103.	30.	1061.	0.	1351.	DISTILLA	1351.	0	0.08	0.08	0.73
41 GTRW16 GT-85RE-16 HEAT	0.	1574.	3641.	980.	1300.	381.	0.	-3739.	3641.	DISTILLA	-98.	0	0.30	0.36	0.27
42 GTR308 GT-60RE-08 POWR	0.	98.	333.	92.	103.	30.	1044.	0.	1378.	DISTILLA	1378.	0	0.07	0.08	0.71
42 GTR308 GT-60RE-08 HEAT	0.	1042.	3544.	980.	1099.	322.	0.	-3110.	3544.	DISTILLA	434.	0	0.23	0.31	0.28
43 GTR312 GT-60RE-12 POWR	0.	133.	302.	95.	103.	30.	1041.	0.	1343.	DISTILLA	1343.	0	0.09	0.08	0.73
43 GTR312 GT-60RE-12 HEAT	0.	1367.	3115.	980.	1065.	312.	0.	-3006.	3115.	DISTILLA	109.	0	0.31	0.34	0.31
44 GTR316 GT-60RE-16 POWR	0.	122.	305.	97.	103.	30.	1039.	0.	1344.	DISTILLA	1344.	0	0.09	0.08	0.73
44 GTR316 GT-60RE-16 HEAT	0.	1336.	3085.	980.	1046.	307.	0.	-2945.	3085.	DISTILLA	140.	0	0.30	0.34	0.32
45 FCPADS FUEL-CL-PH POWR	0.	105.	272.	46.	103.	30.	1099.	0.	1371.	DISTILLA	1371.	0	0.07	0.08	0.72
45 FCPADS FUEL-CL-PH HEAT	0.	2234.	5765.	980.	2191.	642.	0.	-6523.	5765.	DISTILLA	-758.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	141.	251.	58.	103.	30.	1084.	0.	1335.	DISTILLA	1335.	0	0.10	0.08	0.73
46 FCMCDS FUEL-CL-MO HEAT	0.	2362.	4206.	980.	1733.	508.	0.	-5092.	4206.	DISTILLA	-886.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28192 MW 60.58 PROCESS MILLIONS BTU/HR 1961.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	2307.	646.	2307.	COAL-FGD	2953.	0	0.	0.07	0.66
1	STM141	STM-TURB-1	POWR	0.	403.	2267.	1720.	207.	61.	284.	0.	2550.	RESIDUAL	2550.	0	0.14	0.08	0.77
1	STM141	STM-TURB-1	HEAT	0.	459.	2584.	1961.	236.	69.	0.	-91.	2584.	RESIDUAL	2494.	0	0.15	0.09	0.76
1	STM141	STM-TURB-1	POWR	0.	403.	2267.	1720.	207.	61.	284.	0.	2550.	COAL-FGD	2550.	0	0.14	0.08	0.77
1	STM141	STM-TURB-1	HEAT	0.	459.	2584.	1961.	236.	69.	0.	-91.	2584.	COAL-FGD	2494.	0	0.15	0.09	0.76
1	STM141	STM-TURB-1	POWR	0.	403.	2267.	1720.	207.	61.	284.	0.	2550.	COAL-AFB	2550.	0	0.14	0.08	0.77
1	STM141	STM-TURB-1	HEAT	0.	459.	2584.	1961.	236.	69.	0.	-91.	2584.	COAL-AFB	2494.	0	0.15	0.09	0.76
2	STM088	STM-TURB-8	POWR	0.	-793.	3746.	2977.	207.	61.	-1196.	0.	3746.	RESIDUAL	3746.	0	-0.27	0.06	0.52
2	STM088	STM-TURB-8	HEAT	0.	265.	2467.	1961.	136.	40.	0.	220.	2467.	RESIDUAL	2688.	0	0.09	0.05	0.73
2	STM088	STM-TURB-8	POWR	0.	-793.	3746.	2977.	207.	61.	-1196.	0.	3746.	COAL-FGD	3746.	0	-0.27	0.06	0.52
2	STM088	STM-TURB-8	HEAT	0.	265.	2467.	1961.	136.	40.	0.	220.	2467.	COAL-FGD	2688.	0	0.09	0.05	0.73
2	STM088	STM-TURB-8	POWR	0.	-793.	3746.	2977.	207.	61.	-1196.	0.	3746.	COAL-AFB	3746.	0	-0.27	0.06	0.52
2	STM088	STM-TURB-8	HEAT	0.	265.	2467.	1961.	136.	40.	0.	220.	2467.	COAL-AFB	2688.	0	0.09	0.05	0.73
3	PFBSTM	PFB-STMTB-	POWR	0.	386.	1260.	850.	207.	61.	1307.	0.	2567.	COAL-PFB	2567.	0	0.13	0.08	0.76
3	PFBSTM	PFB-STMTB-	HEAT	0.	891.	2906.	1961.	477.	140.	0.	-844.	2906.	COAL-PFB	2062.	0	0.23	0.16	0.67
4	TISTMT	TI-STMTB-1	POWR	0.	395.	960.	602.	207.	61.	1598.	0.	2558.	RESIDUAL	2558.	0	0.13	0.08	0.77
4	TISTMT	TI-STMTB-1	HEAT	0.	1285.	3124.	1961.	673.	197.	0.	-1457.	3124.	RESIDUAL	1668.	0	0.29	0.22	0.63
4	TISTMT	TI-STMTB-1	POWR	0.	395.	960.	602.	207.	61.	1598.	0.	2558.	COAL	2558.	0	0.13	0.08	0.77
4	TISTMT	TI-STMTB-1	HEAT	0.	1285.	3124.	1961.	673.	197.	0.	-1457.	3124.	COAL	1668.	0	0.29	0.22	0.63
5	TIHRSG	THERMIONIC	POWR	0.	205.	1469.	874.	207.	61.	1279.	0.	2748.	RESIDUAL	2748.	0	0.07	0.08	0.71
5	TIHRSG	THERMIONIC	HEAT	0.	460.	3296.	1961.	464.	136.	0.	-803.	3296.	RESIDUAL	2493.	0	0.12	0.14	0.60
5	TIHRSG	THERMIONIC	POWR	0.	205.	1469.	874.	207.	61.	1279.	0.	274[illegible]	COAL	2748.	0	0.07	0.08	0.71
5	TIHRSG	THERMIONIC	HEAT	0.	460.	3296.	1961.	464.	136.	0.	-803.	32[illegible].	COAL	2493.	0	0.12	0.14	0.60
6	STIRL	STIRLING-1	POWR	0.	267.	951.	486.	207.	61.	1735.	0.	2686.	DISTILLA	2686.	0	0.09	0.06	0.73
6	STIRL	STIRLING-1	HEAT	0.	1075.	3836.	1961.	833.	244.	0.	-1958.	3836.	DISTILLA	1878.	0	0.22	0.22	0.51

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28192 MW 60.58 PROCESS MILLIONS BTU/HR 1961.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	267.	951.	486.	207.	61.	1735.	0.	2686.	RESIDUAL	2686.	0	0.09	0.08	0.73
6 STIRL	STIRLING-1	HEAT	0.	1075.	3836.	1961.	833.	244.	0.	-1958.	3836.	RESIDUAL	1878.	0	0.22	0.22	0.51
6 STIRL	STIRLING-1	POWR	0.	267.	951.	486.	207.	61.	1735.	0.	2686.	COAL	2686.	0	0.09	0.08	0.73
6 STIRL	STIRLING-1	HEAT	0.	1075.	3836.	1961.	833.	244.	0.	-1958.	3836.	COAL	1878.	0	0.22	0.22	0.51
7 HEGT85	HELIUM-GT-	POWR	0.	-79.	644.	-69.	207.	61.	2388.	0.	3032.	COAL-AFB	3032.	1	-0.03	0.07	0.65
7 HEGT85	HELIUM-GT-	HEAT	-18422.	2249.	-18422.	1961.	-5913.	-1733.	0.	19125.	-18422.	COAL-AFB	704.	11	-5.48	-8.41	2.79
8 HEGT60	HELIUM-GT-	POWR	0.	-19.	798.	113.	207.	61.	2174.	0.	2972.	COAL-AFB	2972.	0	-0.01	0.07	0.66
8 HEGT60	HELIUM-GT-	HEAT	0.	-325.	13809.	1961.	3577.	1048.	0.	-10531.	13809.	COAL-AFB	3278.	0	-0.02	0.26	0.14
9 HEGT00	HELIUM-GT-	POWR	0.	110.	1174.	543.	207.	61.	1669.	0.	2843.	COAL-AFB	2843.	0	0.04	0.07	0.69
9 HEGT00	HELIUM-GT-	HEAT	0.	397.	4244.	1961.	747.	219.	0.	-1688.	4244.	COAL-AFB	2556.	0	0.09	0.18	0.46
10 FCMCCL	FUEL-CL-MO	POWR	0.	342.	680.	320.	207.	61.	1931.	0.	2611.	COAL	2611.	10	0.12	0.08	0.75
10 FCMCCL	FUEL-CL-MO	HEAT	0.	2098.	4172.	1961.	1268.	372.	0.	-3317.	4172.	COAL	355.	0	0.33	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	354.	582.	247.	207.	61.	2017.	0.	2599.	COAL	2599.	10	0.12	0.08	0.75
11 FCSTCL	FUEL-CL-ST	HEAT	0.	2814.	4625.	1961.	1642.	481.	0.	-4486.	4625.	COAL	139.	0	0.38	0.36	0.42
12 IGGTST	INT-GAS-GT	POWR	0.	269.	813.	370.	207.	61.	1872.	0.	2684.	COAL	2684.	10	0.09	0.08	0.73
12 IGGTST	INT-GAS-GT	HEAT	0.	1425.	4304.	1961.	1095.	321.	0.	-2776.	4304.	COAL	1528.	0	0.25	0.25	0.46
13 GTSOAR	GT-HRSG-10	POWR	0.	252.	713.	271.	207.	61.	1988.	0.	2701.	RESIDUAL	2701.	0	0.09	0.08	0.73
13 GTSOAR	GT-HRSG-10	HEAT	0.	1824.	5157.	1961.	1496.	438.	0.	-4028.	5157.	RESIDUAL	1129.	0	0.26	0.29	0.38
14 GTAC08	GT-HRSG-08	POWR	0.	345.	766.	395.	207.	61.	1843.	0.	2608.	RESIDUAL	2608.	0	0.12	0.08	0.75
14 GTAC08	GT-HRSG-08	HEAT	0.	1713.	3803.	1961.	1027.	301.	0.	-2563.	3903.	RESIDUAL	1240.	0	0.31	0.27	0.52
15 GTAC12	GT-HRSG-12	POWR	0.	338.	678.	314.	207.	61.	1937.	0.	2615.	RESIDUAL	2615.	0	0.11	0.08	0.75
15 GTAC12	GT-HRSG-12	HEAT	0.	2109.	4229.	1961.	1290.	378.	0.	-3385.	4229.	RESIDUAL	844.	0	0.33	0.31	0.46
16 GTAC16	GT-HRSG-16	POWR	0.	322.	640.	269.	207.	61.	1991.	0.	2631.	RESIDUAL	2631.	0	0.11	0.08	0.75
16 GTAC16	GT-HRSG-16	HEAT	0.	2351.	4667.	1961.	1507.	442.	0.	-4064.	4667.	RESIDUAL	602.	0	0.33	0.32	0.42
17 GTWC16	GT-HRSG-16	POWR	0.	303.	656.	266.	207.	61.	1994.	0.	2650.	RESIDUAL	2650.	0	0.10	0.08	0.74
17 GTWC16	GT-HRSG-16	HEAT	0.	2232.	4835.	1961.	1523.	446.	0.	-4113.	4835.	RESIDUAL	721.	0	0.32	0.32	0.41

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28192 MW 60.58 PROCESS MILLIONS BTU/HR 1961.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	292.	582.	193.	207.	61.	2080.	0.	2661.	RESIDUAL	2661.	0	0.10	0.08	0.74
18 CC1626 GTST-16/26 HEAT	0.	2957.	5900.	1961.	2096.	614.	0.	-5904.	5900.	RESIDUAL	-4.	0	0.33	0.36	0.33
19 CC1622 GTST-16/22 POWR	0.	307.	593.	216.	207.	61.	2053.	0.	2646.	RESIDUAL	2646.	0	0.10	0.08	0.74
19 CC1622 GTST-16/22 HEAT	0.	2785.	5389.	1961.	1877.	550.	0.	-5221.	5389.	RESIDUAL	168.	0	0.34	0.35	0.36
20 CC1222 GTST-12/22 POWR	0.	310.	592.	218.	207.	61.	2051.	0.	2643.	RESIDUAL	2643.	0	0.10	0.08	0.74
20 CC1222 GTST-12/22 HEAT	0.	2789.	5336.	1961.	1862.	546.	0.	-5172.	5336.	RESIDUAL	164.	0	0.34	0.35	0.37
21 CC0822 GTST-08/22 POWR	0.	333.	642.	279.	207.	61.	1979.	0.	2620.	RESIDUAL	2620.	0	0.11	0.08	0.75
21 CC0822 GTST-08/22 HEAT	0.	2337.	4509.	1961.	1452.	426.	0.	-3893.	4509.	RESIDUAL	616.	0	0.34	0.32	0.43
22 STIG15 STIG-15-16 POWR	0.	112.	543.	7.	207.	61.	2299.	0.	2841.	RESIDUAL	2841.	1	0.04	0.07	0.69
22 STIG15 STIG-15-16 HEAT	0.	31062.	150846.	1961.	57472.	16844.	0.	*******	150846.	RESIDUAL	-28109.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	160.	576.	76.	207.	61.	2217.	0.	2793.	RESIDUAL	2793.	1	0.05	0.07	0.70
23 STIG10 STIG-10-16 HEAT	0.	4115.	14800.	1961.	5315.	1558.	0.	-15962.	14800.	RESIDUAL	-1162.	1	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	182.	617.	130.	207.	61.	2154.	0.	2771.	RESIDUAL	2771.	1	0.06	0.07	0.71
24 STIG1S STIG-1S 16 HEAT	0.	2749.	9303.	1961.	3118.	914.	0.	-9099.	9303.	RESIDUAL	204.	1	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	187.	557.	84.	207.	61.	2208.	0.	2766.	RESIDUAL	2766.	1	0.06	0.07	0.71
25 DEADV3 DIESEL-ADV HEAT	0.	4385.	13037.	1961.	4837.	1418.	0.	-14469.	13037.	RESIDUAL	-1432.	1	0.25	0.37	0.15
26 DEADV2 DIESEL-ADV POWR	0.	255.	557.	142.	207.	61.	2141.	0.	2698.	RESIDUAL	2698.	1	0.09	0.08	0.73
26 DEADV2 DIESEL-ADV HEAT	0.	3538.	7720.	1961.	2864.	839.	0.	-8305.	7720.	RESIDUAL	-585.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	345.	557.	218.	207.	61.	2051.	0.	2608.	RESIDUAL	2608.	1	0.12	0.08	0.75
27 DEADV1 DIESEL-ADV HEAT	0.	3106.	5015.	1961.	1861.	545.	0.	-5169.	5015.	RESIDUAL	-153.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	268.	769.	332.	207.	61.	1917.	0.	2685.	RESIDUAL	2685.	0	0.09	0.08	0.73
28 DEHTPM ADV-DIESEL HEAT	0.	1583.	4540.	1961.	1221.	358.	0.	-3170.	4540.	RESIDUAL	1370.	0	0.26	0.27	0.43
29 DESOA3 DIESEL-SOA POWR	0.	152.	573.	67.	207.	61.	2229.	0.	2801.	DISTILLA	2801.	1	0.05	0.07	0.70
29 DESOA3 DIESEL-SOA HEAT	0.	4465.	16845.	1961.	6081.	1782.	0.	-18357.	16845.	DISTILLA	-1512.	1	0.21	0.36	0.12
29 DESOA3 DIESEL-SOA POWR	0.	152.	573.	67.	207.	61.	2229.	0.	2801.	RESIDUAL	2801.	1	0.05	0.07	0.70
29 DESOA3 DIESEL-SOA HEAT	0.	4465.	16845.	1961.	6081.	1782.	0.	-18357.	16845.	RESIDUAL	-1512.	1	0.21	0.36	0.12

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28192 MW 60.58 PROCESS MILLIONS BTU/HR 1961.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8106.

POWER TO HEAT RATIO 0.105

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	222.	573.	126.	207.	61.	2159.	0.	2731.	DISTILLA	2731.	1	0.08	0.08	0.72
30	DESOA2	DIESEL-SOA	HEAT	0.	3449.	8914.	1961.	3218.	943.	0.	-9410.	8914.	DISTILLA	-496.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	222.	573.	126.	207.	61.	2159.	0.	2731.	RESIDUAL	2731.	1	0.08	0.08	0.72
30	DESOA2	DIESEL-SOA	HEAT	0.	3449.	8914.	1961.	3218.	943.	0.	-9410.	8914.	RESIDUAL	-496.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	343.	573.	230.	207.	61.	2037.	0.	2610.	DISTILLA	2610.	1	0.12	0.08	0.75
31	DESOA1	DIESEL-SOA	HEAT	0.	2934.	4890.	1961.	1765.	517.	0.	-4871.	4890.	DISTILLA	19.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	343.	573.	230.	207.	61.	2037.	0.	2610.	RESIDUAL	2610.	1	0.12	0.08	0.75
31	DESOA1	DIESEL-SOA	HEAT	0.	2934.	4890.	1961.	1765.	517.	0.	-4871.	4890.	RESIDUAL	19.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	316.	708.	321.	207.	61.	1930.	0.	2637.	DISTILLA	2637.	0	0.11	0.08	0.74
32	GTSOAD	GT-HRSG-10	HEAT	0.	1928.	4327.	1961.	1263.	370.	0.	-3302.	4327.	DISTILLA	1025.	0	0.31	0.29	0.45
33	GTRA08	GT-85RE-08	POWR	0.	251.	579.	157.	207.	61.	2123.	0.	2702.	DISTILLA	2702.	0	0.09	0.08	0.73
33	GTRA08	GT-85RE-08	HEAT	0.	3145.	7248.	1961.	2587.	758.	0.	-7440.	7248.	DISTILLA	-192.	0	0.30	0.36	0.27
34	GTRA12	GT-85RE-12	POWR	0.	267.	577.	168.	207.	61.	2109.	0.	2686.	DISTILLA	2686.	0	0.09	0.08	0.73
34	GTRA12	GT-85RE-12	HEAT	0.	3105.	6723.	1961.	2407.	705.	0.	-6875.	6723.	DISTILLA	-152.	0	0.32	0.36	0.29
35	GTRA16	GT-85RE-16	POWR	0.	274.	592.	187.	207.	61.	2087.	0.	2679.	DISTILLA	2679.	0	0.09	0.08	0.73
35	GTRA16	GT-85RE-16	HEAT	0.	2870.	6209.	1961.	2167.	635.	0.	-6125.	6209.	DISTILLA	83.	0	0.32	0.35	0.32
36	GTR208	GT-60RE-08	POWR	0.	280.	646.	238.	207.	61.	2027.	0.	2673.	DISTILLA	2673.	0	0.09	0.08	0.73
36	GTR208	GT-60RE-08	HEAT	0.	2307.	5323.	1961.	1703.	499.	0.	-4677.	5323.	DISTILLA	646.	0	0.30	0.32	0.37
37	GTR212	GT-60RE-12	POWR	0.	280.	626.	221.	207.	61.	2047.	0.	2673.	DISTILLA	2673.	0	0.09	0.08	0.73
37	GTR212	GT-60RE-12	HEAT	0.	2480.	5546.	1961.	1830.	536.	0.	-5074.	5546.	DISTILLA	473.	0	0.31	0.33	0.35
38	GTR216	GT-60RE-16	POWR	0.	285.	613.	215.	207.	61.	2055.	0.	2668.	DISTILLA	2668.	0	0.10	0.08	0.74
38	GTR216	GT-60RE-16	HEAT	0.	2605.	5605.	1961.	1889.	554.	0.	-5257.	5605.	DISTILLA	348.	0	0.32	0.34	0.35
39	GTRW08	GT-85RE-08	POWR	0.	216.	589.	135.	207.	61.	2148.	0.	2737.	DISTILLA	2737.	0	0.07	[illegible]	0.72
39	GTRW08	GT-85RE-08	HEAT	0.	3136.	8554.	1961.	3002.	880.	0.	-8736.	8554.	DISTILLA	-183.	0	0.27	0.35	0.23
40	GTRW12	GT-85RE-12	POWR	0.	241.	568.	139.	207.	61.	2144.	0.	27[illegible]2.	DISTILLA	2712.	0	0.08	0.08	0.72
40	GTRW12	GT-85RE-12	HEAT	0.	3411.	8027.	1961.	2922.	856.	0.	-8485.	8027.	DISTILLA	-458.	0	0.30	0.36	0.24

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
I&SE PEO ADV DESIGN ENGR REPORT 5.1
FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28192 MW 60.58 PROCESS MILLIONS BTU/HR 1961.0 PROCESS TEMP(F) 495. PRODUCT ALUMINA HOURS PER YEAR 8136.

POWER TO HEAT RATIO 0.105
UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	250.	579.	156.	207.	61.	2124.	0.	2703.	DISTILLA	2703.	0	0.08	0.08	0.73
41 GTRW16 GT-85RE-16 HEAT	0.	3150.	7286.	1961.	2601.	762.	0.	-7483.	7286.	DISTILLA	-197.	0	0.30	0.36	0.27
42 GTR308 GT-60RE-08 POWR	0.	196.	667.	184.	207.	61.	2090.	0.	2757.	DISTILLA	2757.	0	0.07	0.07	0.71
42 GTR308 GT-60RE-08 HEAT	0.	2085.	7092.	1961.	2195.	644.	0.	-6224.	7092.	DISTILLA	868.	0	0.23	0.31	0.28
43 GTR312 GT-60RE-12 FOWR	0.	265.	604.	190.	207.	61.	2083.	0.	2688.	DISTILLA	2688.	0	0.09	0.08	0.73
43 GTR312 GT-60RE-12 HEAT	0.	2736.	6233.	1961.	2132.	625.	0.	-6010	6233.	DISTILLA	217.	0	0.31	0.34	0.31
44 GTR316 GT-60RE-16 POWR	0.	264.	610.	194.	207.	61.	2079.	0.	2689.	DISTILLA	2689.	0	0.09	0.08	0.73
44 GTR316 GT-60RE-16 HEAT	0.	2674.	6173.	1961.	2093.	613.	0.	-5894.	6173.	DISTILLA	279.	0	0.30	0.34	0.32
45 FCPADS FUEL-CL-PH POWR	0.	211.	544.	92.	207.	61.	2198.	0.	2742.	DISTILLA	2742.	0	0.07	0.08	0.72
45 FCPADS FUEL-CL-PH HEAT	0.	4470.	11535.	1961.	4383.	1285.	0.	-13052.	11535.	DISTILLA	-1517.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	282.	502.	117.	207.	61.	2170.	0.	2671.	DISTILLA	2671.	0	0.10	0.08	0.73
46 FCMCDS FUEL-CL-MO HEAT	0.	4727.	8416.	1961.	3468.	1016.	0.	-10190.	8416.	DISTILLA	-1774.	0	0.36	0.41	0.23

DATE 06/06/79 GENERAL ELECTRIC COMPANY

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28212 MW 4.00 PROCESS MILLIONS BTU/HR 207.0 PROCESS TEMP(F) 422. PRODUCT VINYL-CHLORI HOURS PER YEAR 8300

POWER TO HEAT RATIO 0.066

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONCOGN	N O C O G O N		0.	0.	0.	0.	0.	0.	244.	43.	244.	COAL-FGD	286.	0	0.	0.05	0.72
1	STM141	STM-TURB-1	POWR	0.	27.	108.	78.	14.	4.	152.	0.	260.	RESIDUAL	260.	10	0.09	0.05	0.80
1	STM141	STM-TURB-1	HEAT	0.	71.	286.	207.	36.	11.	0.	-70.	286.	RESIDUAL	216.	0	0.20	0.13	0.72
1	STM141	STM-TURB-1	POWR	0.	27.	108.	78.	14.	4.	152.	0.	260.	COAL-FGD	260.	10	0.09	0.05	0.80
1	STM141	STM-TURB-1	HEAT	0.	71.	286.	207.	36.	11.	0.	-70.	286.	COAL-FGD	216.	0	0.20	0.13	0.72
1	STM141	STM-TURB-1	POWR	0.	27.	108.	78.	14.	4.	152.	0.	260.	COAL-AFB	260.	10	0.09	0.05	0.80
1	STM141	STM-TURB-1	HEAT	0.	71.	286.	207.	36.	11.	0.	-70.	286.	COAL-AFB	216.	0	0.20	0.13	0.72
2	STM088	STM-TURB-8	POWR	0.	27.	149.	113.	14.	4.	110.	0.	260.	RESIDUAL	260.	10	0.09	0.05	0.80
2	STM088	STM-TURB-8	HEAT	0.	49.	273.	207.	25.	7.	0.	-35.	273.	RESIDUAL	238.	0	0.15	0.09	0.76
2	STM088	STM-TURB-8	POWR	0.	27.	149.	113.	14.	4.	110.	0.	260.	COAL-FGD	260.	10	0.09	0.05	0.80
2	STM088	STM-TURB-8	HEAT	0.	49.	273	207.	25.	7.	0.	-35.	273.	COAL-FGD	238.	0	0.15	0.09	0.76
2	STM088	STM-TURB-8	POWR	0.	27.	149.	113.	14.	4.	110.	0.	260.	COAL-AFB	260.	10	0.09	0.05	0.80
2	STM088	STM-TURB-8	HEAT	0.	49.	273.	207.	25.	7.	0.	-35.	273.	COAL-AFB	238	0	0.15	0.09	0.76
3	PFBSTM	PFB-STMTB-	POWR	0.	26.	70.	45.	14.	4.	190.	0.	260.	COAL-PFB	260.	10	0.09	0.05	0.80
3	PFBSTM	PFB-STMTB-	HEAT	0.	118.	320.	207.	62.	18.	0.	-152.	320.	COAL-PFB	168.	0	0.27	0.19	0.65
4	TISTMT	TI-STMTB-1	POWR	0.	26.	56.	33.	14.	4.	204.	0.	260.	RESIDUAL	260.	10	0.09	0.05	0.80
4	TISTMT	TI-STMTB-1	HEAT	0.	162.	346.	207.	85.	25.	0.	-222.	346.	RESIDUAL	124.	0	0.32	0.24	0.60
4	TISTMT	TI-STMTB-1	POWR	0.	26.	56.	33.	14.	4.	204.	0.	260.	COAL	260.	10	0.09	0.05	0.80
4	TISTMT	TI-STMTB-1	HEAT	0.	162.	346.	207.	85.	25.	0.	-222.	346.	COAL	124.	0	0.32	0.24	0.60
5	TIHRSG	THERMIONIC	POWR	0.	17.	97.	61.	14.	4.	172.	0.	269.	RESIDUAL	269.	0	0.06	0.05	0.77
5	TIHRSG	THERMIONIC	HEAT	0.	58.	331.	207.	47.	14.	0.	-103.	331.	RESIDUAL	228.	0	0.15	0.14	0.63
5	TIHRSG	THERMIONIC	POWR	0.	17.	97.	61.	14.	4.	172.	0.	269.	COAL	269.	0	0.06	0.05	0.77
5	TIHRSG	THERMIONIC	HEAT	0.	58.	331.	207.	47.	14.	0.	-103.	331.	COAL	228.	0	0.15	0.14	0.63
6	STIRL	STIRLING-1	POWR	0.	18.	57.	28.	14.	4.	210.	0.	268.	DISTILLA	268.	0	0.06	0.05	0.77
6	STIRL	STIRLING-1	HEAT	0.	135.	422.	207.	100.	29.	0.	-271.	422.	DISTILLA	151.	0	0.24	0.24	0.49

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28212 MW 4.00 PROCESS MILLIONS BTU/HR 207.0 PROCESS TEMP(F) 422. PRODUCT VINYL-CHLORI HOURS PER YEAR 8300.

POWER TO HEAT RATIO 0.066

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	18.	57.	28.	14.	4.	210.	0.	268.	RESIDUAL	268.	0	0.06	0.05	0.77
6	STIRL	STIRLING-1	HEAT	0.	135.	422.	207.	100.	29.	0.	-271.	422.	RESIDUAL	151.	0	0.24	0.24	0.49
6	STIRL	STIRLING-1	POWR	0.	18.	57.	28.	14.	4.	210.	0.	268.	COAL	268.	0	0.06	0.05	0.77
6	STIRL	STIRLING-1	HEAT	0.	135.	422.	207.	100.	29.	0.	-271.	422.	COAL	151.	0	0.24	0.24	0.49
7	HEGT85	HELIUM-GT-	POWR	0.	2.	43.	1.	14.	4.	242.	0.	285.	COAL-AFB	285.	11	0.01	0.05	0.73
7	HEGT85	HELIUM-GT-	HEAT	0.	267.	7482.	207.	2402.	704.	0.	-7463.	7482.	COAL-AFB	19.	1	0.03	0.32	0.03
8	HEGT60	HELIUM-GT-	POWR	0.	4.	53.	12.	14.	4.	229.	0.	282.	COAL-AFB	282.	10	0.02	0.05	0.73
8	HEGT60	HELIUM-GT-	HEAT	0.	74.	890.	207.	231.	68.	0.	-678.	890.	COAL-AFB	212.	0	0.08	0.26	0.23
9	HEGT00	HELIUM-GT-	POWR	0.	9.	78.	37.	14.	4.	200.	0.	278.	COAL-AFB	278.	10	0.03	0.05	0.75
9	HEGT00	HELIUM-GT-	HEAT	0.	48.	435.	207.	77.	22.	0.	-197.	435.	COAL-AFB	238.	10	0.10	0.18	0.48
10	FCMCCL	FUEL-CL-MO	POWR	0.	23.	45.	21.	14.	4.	219.	0.	263.	COAL	263.	10	0.08	0.05	0.79
10	FCMCCL	FUEL-CL-MO	HEAT	0.	222.	439.	207.	133.	39.	0.	-374.	439.	COAL	65.	10	0.34	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	24.	36.	15.	14.	4.	226.	0.	263.	COAL	263.	10	0.08	0.05	0.79
11	FCSTCL	FUEL-CL-ST	HEAT	0.	330.	511.	207.	191.	56.	0.	-556.	511.	COAL	-44.	10	0.39	0.37	0.40
12	IGGTST	INT-GAS-GT	POWR	0.	18.	50.	22.	14.	4.	218.	0.	268.	COAL	268.	10	0.06	0.05	0.77
12	IGGTST	INT-GAS-GT	HEAT	0.	177.	476.	207.	131.	38.	0.	-368.	476.	COAL	109.	10	0.27	0.28	0.43
13	GTSOAR	GT-HRSG-10	POWR	0.	18.	47.	19.	14.	4.	221.	0.	268.	RESIDUAL	268.	10	0.06	0.05	0.77
13	GTSOAR	GT-HRSG-10	HEAT	0.	196.	510.	207.	148.	43.	0.	-419.	510.	RESIDUAL	90.	0	0.28	0.29	0.41
14	GTAC08	GT-HRSG-08	POWR	0.	23.	51.	26.	14.	4.	213.	0.	263.	RESIDUAL	263.	10	0.08	0.05	0.79
14	GTAC08	GT-HRSG-08	HEAT	0.	181.	401.	207.	108.	32.	0.	-296.	401.	RESIDUAL	105.	0	0.31	0.27	0.52
15	GTAC12	GT-HRSG-12	POWR	0.	22.	45.	21.	14.	4.	219.	0.	264.	RESIDUAL	264.	10	0.08	0.05	0.78
15	GTAC12	GT-HRSG-12	HEAT	0.	223.	447.	207.	136.	40.	0.	-384.	447.	RESIDUAL	64.	0	0.33	0.31	0.46
16	GTAC16	GT-HRSG-16	POWR	0.	22.	42.	18.	14.	4.	222.	0.	265.	RESIDUAL	265.	10	0.08	0.05	0.78
16	GTAC16	GT-HRSG-16	HEAT	0.	248.	486.	207.	157.	46.	0.	-447.	486.	RESIDUAL	38.	0	0.34	0.32	0.43
17	GTWC16	GT-HRSG-16	POWR	0.	20.	43.	18.	14.	4.	223.	0.	266.	RESIDUAL	266.	10	0.07	0.05	0.78
17	GTWC16	GT-HRSG-16	HEAT	0.	236.	511.	207.	161.	47.	0.	-460.	511.	RESIDUAL	51.	0	0.32	0.32	0.41

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28212 MW 4.00 PROCESS MILLIONS BTU/HR 207.0 PROCESS TEMP(F) 422. PRODUCT VINYL-CHLORI HOURS PER YEAR 8300.

POWER TO HEAT RATIO 0.066

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	20.	37.	12.	14.	4.	230.	0.	267.	RESIDUAL	267.	10	0.07	0.05	0.78
18 CC1626 GTST-16/26 HEAT	0.	347.	653.	207.	242.	71.	0.	-714.	653.	RESIDUAL	-61.	0	0.35	0.37	0.32
19 CC1622 GTST-16/22 POWR	0.	21.	37.	13.	14.	4.	228.	0.	266.	RESIDUAL	266.	10	0.07	0.05	0.78
19 CC1622 GTST-16/22 HEAT	0.	327.	596.	207.	218.	64.	0.	-637.	596.	RESIDUAL	-41.	0	0.35	0.36	0.35
20 CC1222 GTST-12/22 POWR	0.	21.	37.	13.	14.	4.	228.	0.	265.	RESIDUAL	265.	10	0.07	0.05	0.78
20 CC1222 GTST-12/22 HEAT	0.	328.	591.	207.	216.	63.	0.	-633.	591.	RESIDUAL	-42.	0	0.36	0.37	0.35
21 CC0822 GTST-08/22 POWR	0.	22.	40.	17.	14.	4.	224.	0.	264.	RESIDUAL	264.	10	0.08	0.05	0.78
21 CC0822 GTST-08/22 HEAT	0.	278.	499.	207.	171.	50.	0.	-491.	499.	RESIDUAL	8.	0	0.36	0.34	0.41
22 STIG15 STIG-15-16 POWR	0.	7.	36.	0.	14.	4.	243.	0.	279.	RESIDUAL	279.	10	0.03	0.05	0.74
22 STIG15 STIG-15-16 HEAT	0.	3279.	15923.	207.	6067.	1778.	0.	-18916.	15923.	RESIDUAL	-2993.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	11.	38.	5.	14.	4.	238.	0.	276.	RESIDUAL	276.	10	0.04	0.05	0.75
23 STIG10 STIG-10-16 HEAT	0.	434.	1562.	207.	561.	164.	0.	-1711.	1562.	RESIDUAL	-148.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	12.	41.	9.	14.	4.	233.	0.	274.	RESIDUAL	274.	10	0.04	0.05	0.76
24 STIG1S STIG-1S-16 HEAT	0.	290.	982.	207.	329.	96.	0.	-986.	982.	RESIDUAL	-4.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	14.	37.	7.	14.	4.	236.	0.	272.	RESIDUAL	272.	0	0.05	0.05	0.76
25 DEADV3 DIESEL-ADV HEAT	0.	426.	1142.	207.	424.	124.	0.	-1281.	1142.	RESIDUAL	-139.	0	0.27	0.37	0.18
26 DEADV2 DIESEL-ADV POWR	0.	17.	37.	9.	14.	4.	233.	0.	269.	RESIDUAL	269.	1	0.06	0.05	0.77
26 DEADV2 DIESEL-ADV HEAT	0.	373.	815.	207.	302.	89.	0.	-902.	815.	RESIDUAL	-87.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	23.	37.	14	14.	4.	227.	0.	263.	RESIDUAL	263.	1	0.08	0.05	0.79
27 DEADV1 DIESEL-ADV HEAT	0.	328.	529.	207.	196.	58.	0.	-571.	529.	RESIDUAL	-42.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	20.	45.	19.	14.	4.	221.	0.	266.	RESIDUAL	266.	0	0.07	0.05	0.78
28 DEHTPM ADV-DIESEL HEAT	0.	219.	484.	207.	147.	43.	0.	-417.	484.	RESIDUAL	67.	0	0.31	0.30	0.43
29 DESOA3 DIESEL-SOA POWR	0.	11.	38.	6.	14.	4.	237.	0.	275.	DISTILLA	275.	0	0.04	0.05	0.75
29 DESOA3 DIESEL-SOA HEAT	0.	424.	1405.	207.	507.	149.	0.	-1543.	1405.	DISTILLA	-137.	0	0.23	0.36	0.15
29 DESOA3 DIESEL-SOA POWR	0.	11.	38.	6.	14.	4.	237.	0.	275.	RESIDUAL	275.	0	0.04	0.05	0.75
29 DESOA3 DIESEL-SOA HEAT	0.	424.	1405.	207.	507.	149.	0.	-1543.	1405.	RESIDUAL	-137.	0	0.23	0.36	0.15

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28212 MW 4.00 PROCESS MILLIONS BTU/HR 207.0 PROCESS TEMP(F) 422. PRODUCT VINYL-CHLORI HOURS PER YEAR 8300.

POWER TO HEAT RATIO 0.066

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	15.	38.	8.	14.	4.	234.	0.	272.	DISTILLA	272.	1	0.05	0.05	0.76
30 DESOA2 DIESEL-SOA HEAT	0.	364.	941.	207.	340.	100.	0.	-1019.	941.	DISTILLA	-78.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	15.	38.	8.	14.	4.	234.	0.	272.	RESIDUAL	272.	1	0.05	0.05	0.76
30 DESOA2 DIESEL-SOA HEAT	0.	364.	941.	207.	340.	100.	0.	-1019.	941.	RESIDUAL	-78.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	23.	38.	15.	14.	4.	226.	0.	263.	DISTILLA	263.	1	0.08	0.05	0.79
31 DESOA1 DIESEL-SOA HEAT	0.	310.	516.	207.	186.	55.	0.	-540.	516.	DISTILLA	-23.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	23.	38.	15.	14.	4.	226.	0.	263.	RESIDUAL	263.	1	0.08	0.05	0.79
31 DESOA1 DIESEL-SOA HEAT	0.	310.	516.	207.	186.	55.	0.	-540.	516.	RESIDUAL	-23.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	21.	47.	21.	14.	4.	218.	0.	265.	DISTILLA	265.	10	0.07	0.05	0.78
32 GTSOAD GT-HRSG-10 HEAT	0.	204.	454.	207.	133.	39.	0.	-371.	454.	DISTILLA	82.	0	0.31	0.29	0.46
33 GTRA08 GT-85RE-08 POWR	0.	18.	38.	12.	14.	4.	230.	0.	268.	DISTILLA	268.	10	0.06	0.05	0.77
33 GTRA08 GT-85RE-08 HEAT	0.	321.	667.	207.	238.	70.	0.	-701.	667.	DISTILLA	-34.	0	0.32	0.36	0.31
34 GTRA12 GT-85RE-12 POWR	0.	19.	38.	12.	14.	4.	229.	0.	267.	DISTILLA	267.	10	0.07	0.05	0.78
34 GTRA12 GT-85RE-12 HEAT	0.	319.	638.	207.	228.	67.	0.	-671.	638.	DISTILLA	-33.	0	0.33	0.36	0.32
35 GTRA16 GT-85RE-16 POWR	0.	19.	39.	13.	14.	4.	228.	0.	267.	DISTILLA	267.	10	0.07	0.05	0.78
35 GTRA16 GT-85RE-16 HEAT	0.	298.	602.	207.	210.	62.	0.	-614.	602.	DISTILLA	-12.	0	0.33	0.35	0.34
36 GTR208 GT-60RE-08 POWR	0.	19.	43.	17.	14.	4.	224.	0.	267.	DISTILLA	267.	10	0.07	0.05	0.78
36 GTR208 GT-60RE-08 HEAT	0.	244.	533.	207.	171.	50.	0.	-491.	533.	DISTILLA	43.	0	0.31	0.32	0.39
37 GTR212 GT-60RE-12 POWR	0.	19.	41.	15.	14.	4.	225.	0.	267.	DISTILLA	267.	10	0.07	0.05	0.78
37 GTR212 GT-60RE-12 HEAT	0.	261.	555.	207.	183.	54.	0.	-530.	555.	DISTILLA	25.	0	0.32	0.33	0.37
38 GTR216 GT-60RE-16 POWR	0.	20.	40.	15.	14.	4.	226.	0.	266.	DISTILLA	266.	10	0.07	0.05	0.78
38 GTR216 GT-60RE-16 HEAT	0.	273.	558.	207.	188.	55.	0.	-546.	558.	DISTILLA	13.	0	0.33	0.34	0.37
39 GTRW08 GT-85RE-08 POWR	0.	16.	39.	10.	14.	4.	232.	0.	271.	DISTILLA	271.	10	0.05	0.05	0.76
39 GTRW08 GT-85RE-08 HEAT	0.	321.	801.	207.	281.	82.	0.	-836.	801.	DISTILLA	-35.	0	0.29	0.35	0.26
40 GTRW12 GT-85RE-12 POWR	0.	17.	37.	10.	14.	4.	232.	0.	269.	DISTILLA	269.	10	0.06	0.05	0.77
40 GTRW12 GT-85RE-12 HEAT	0.	350.	773.	207.	281.	82.	0.	-836.	773.	DISTILLA	-64.	0	0.31	0.36	0.27

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28212 MW 4.00 PROCESS MILLIONS BTU/HR 207.0 PROCESS TEMP(F) 422. PRODUCT VINYL-CHLORI HOURS PER YEAR 8300.

POWER TO HEAT RATIO 0.066

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0 HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	17.	38.	11.	14.	4.	231.	0.	269.	DISTILLA	269.	10	0.06	0.05	0.77
41 GTRW16 GT-85RE-16 HEAT	0.	327.	719.	207.	257.	75.	0.	-760.	719.	DISTILLA	-41.	0	0.31	0.36	0.29
42 GTR308 GT-60RE-08 POWR	0.	14.	44.	13.	14.	4.	228.	0.	272.	DISTILLA	272.	10	0.05	0.05	0.76
42 GTR308 GT-60RE-08 HEAT	0.	222.	687.	207.	213.	62.	0.	-622.	687.	DISTILLA	64.	0	0.24	0.31	0.30
43 GTR312 GT-60RE-12 POWR	0.	18.	40.	13.	14.	4.	228.	0.	268.	DISTILLA	268.	10	0.06	0.05	0.77
43 GTR312 GT-60RE-12 HEAT	0.	287.	639.	207.	218.	64.	0.	-640.	639.	DISTILLA	-1.	0	0.31	0.34	0.32
44 GTR316 GT-60RE-16 POWR	0.	18.	40.	13.	14.	4.	228.	0.	268.	DISTILLA	268.	10	0.06	0.05	0.77
44 GTR316 GT-60RE-16 HEAT	0.	281.	634.	207.	215.	63.	0.	-629.	634.	DISTILLA	5.	0	0.31	0.34	0.33
45 FCPADS FUEL-CL-PH POWR	0.	14.	36.	6.	14.	4.	230.	0.	272.	DISTILLA	272.	0	0.05	0.05	0.76
45 FCPADS FUEL-CL-PH HEAT	0.	472.	1218.	207.	463.	136.	0.	-1403.	1218.	DISTILLA	-186.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	19.	33.	8.	14.	4.	234.	0.	268.	DISTILLA	268.	10	0.07	0.05	0.77
46 FCMCDS FUEL-CL-MO HEAT	0.	499.	888.	207.	366.	107.	0.	-1101.	888.	DISTILLA	-213.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28213 MW 55.00 PROCESS MILLIONS BTU/HR 16.0 PROCESS TEMP(F) 448. PRODUCT LOW-DENSITY- HOURS PER YEAR 7900.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	19.	586.	19.	RESIDUAL	605.	0	0.	0.31	0.03
1	STM141	STM-TURB-1	POWR	0.	-1655.	2260.	1733.	188.	55.	-2020.	0.	2260.	RESIDUAL	2260.	0	-2.73	0.08	0.01
1	STM141	STM-TURB-1	HEAT	0.	3.	21.	16.	2.	1.	0.	581.	21.	RESIDUAL	602.	10	0.01	0.00	0.03
1	STM141	STM-TURB-1	POWR	0.	-1655.	2260.	1733.	188.	55.	-2020.	0.	2260.	COAL-FGD	2260.	0	-2.73	0.08	0.01
1	STM141	STM-TURB-1	HEAT	0.	3.	21.	16.	2.	1.	0.	581.	21.	COAL-FGD	602.	10	0.01	0.00	0.03
1	STM141	STM-TURB-1	POWR	0.	-1655.	2260.	1733.	188.	55.	-2020.	0.	2260.	COAL-AFB	2260.	0	-2.73	0.08	0.01
1	STM141	STM-TURB-1	HEAT	0.	3.	21.	16.	2.	1.	0.	581.	21.	COAL-AFB	602.	10	0.01	0.00	0.03
2	STM088	STM-TURB-8	POWR	0.	-3404.	4009.	3220.	188.	55.	-3770.	0.	4009.	RESIDUAL	4009.	0	-5.62	0.05	0.00
2	STM088	STM-TURB-8	HEAT	0.	2.	20.	16.	1.	0.	0.	584.	20.	RESIDUAL	603.	10	0.00	0.00	0.03
2	STM088	STM-TURB-8	POWR	0.	-3404.	4009.	3220.	188.	55.	-3770.	0.	4009.	COAL-FGD	4009.	0	-5.62	0.05	0.00
2	STM088	STM-TURB-8	HEAT	0.	2.	20.	16.	1.	0.	0.	584.	20.	COAL-FGD	603.	10	0.00	0.00	0.03
2	STM088	STM-TURB-8	POWR	0.	-3404.	4009.	3220.	188.	55.	-3770.	0.	4009.	COAL-AFB	4009.	0	-5.62	0.05	0.00
2	STM088	STM-TURB-8	HEAT	0.	2.	20.	16.	1.	0.	0.	584.	20.	COAL-AFB	603.	10	0.00	0.00	0.03
3	PFBSTM	PFB-STMTB-	POWR	0.	-590.	1195.	814.	188.	55.	-939.	0.	1195.	COAL-PFB	1195.	0	-0.97	0.16	0.01
3	PFBSTM	PFB-STMTB-	HEAT	0.	7.	23.	16.	4.	1.	0.	575.	23.	COAL-PFB	598.	10	0.01	0.01	0.03
4	TISTMT	TI-STMTB-1	POWR	0.	-295.	900.	571.	188.	55.	-653.	0.	900.	RESIDUAL	900.	0	-0.49	0.21	0.02
4	TISTMT	TI-STMTB-1	HEAT	0.	10.	25.	16.	5.	2.	0.	570.	25.	RESIDUAL	595.	10	0.02	0.01	0.03
4	TISTMT	TI-STMTB-1	POWR	0.	-295.	900.	571.	188.	55.	-653.	0.	900.	COAL	900.	0	-0.49	0.21	0.02
4	TISTMT	TI-STMTB-1	HEAT	0.	10.	25.	16.	5.	2.	0.	570.	25.	COAL	595.	10	0.02	0.01	0.03
5	TIHRSG	THERMIONIC	POWR	0.	-728.	1334.	821.	188.	55.	-947.	0.	1334.	RESIDUAL	1334.	0	-1.20	0.14	0.01
5	TIHRSG	THERMIONIC	HEAT	0.	4.	26.	16.	4.	1.	0.	575.	26.	RESIDUAL	601.	10	0.01	0.01	0.03
5	TIHRSG	THERMIONIC	POWR	0.	-728.	1334.	821.	188.	55.	-947.	0.	1334.	COAL	1334.	0	-1.20	0.14	0.01
5	TIHRSG	THERMIONIC	HEAT	0.	4.	26.	16.	4.	1.	0.	575.	26.	COAL	601.	10	0.01	0.01	0.03
6	STIRL	STIRLING-1	POWR	0.	-208.	813.	405.	188.	55.	-458.	0.	813.	DISTILLA	813.	0	-0.34	0.23	0.02
6	STIRL	STIRLING-1	HEAT	0.	10.	32.	16.	7.	2.	0.	563.	32.	DISTILLA	595.	0	0.02	0.01	0.03

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28213 MW 55.00 PROCESS MILLIONS BTU/HR 16.0 PROCESS TEMP(F) 448. PRODUCT LOW-DENSITY- HOURS PER YEAR 7900.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-208.	813.	405.	188.	55.	-458.	0.	813.	RESIDUAL	813.	0	-0.34	0.23	0.02
6 STIRL STIRLING-1 HEAT	0.	10.	32.	16.	7.	2.	0.	563.	32.	RESIDUAL	595.	0	0.02	0.01	0.03
6 STIRL STIRLING-1 POWR	0.	-208.	813.	405.	188.	55.	-458.	0.	813.	COAL	813.	0	-0.34	0.23	0.02
6 STIRL STIRLING-1 HEAT	0.	10.	32.	16.	7.	2.	0.	563.	32.	COAL	595.	0	0.02	0.01	0.03
7 HEGT85 HELIUM-GT- POWR	0.	-11.	585.	-11.	188.	55.	31.	0.	616.	COAL-AFB	616.	1	-0.02	0.30	0.03
7 HEGT85 HELIUM-GT- HEAT	-888.	16.	-888.	16.	-285.	-84.	0.	1477.	-888.	COAL-AFB	589.	11	-1.44	-0.48	0.03
8 HEGT60 HELIUM-GT- POWR	0.	-119.	725.	146.	188.	55.	-154.	0.	725.	COAL-AFB	725.	0	-0.20	0.26	0.02
8 HEGT60 HELIUM-GT- HEAT	0.	4.	79.	16.	20.	6.	0.	522.	79.	COAL-AFB	602.	10	0.01	0.03	0.03
9 HEGT00 HELIUM-GT- POWR	0.	-461.	1066.	502.	188.	55.	-572.	0.	1066.	COAL-AFB	1066.	0	-0.76	0.18	0.02
9 HEGT00 HELIUM-GT- HEAT	0.	4.	34.	16.	6.	2.	0.	568.	34.	COAL-AFB	602.	10	0.01	0.01	0.03
10 FCMCCL FUEL-CL-MO POWR	0.	-12.	617.	291.	188.	55.	-323.	0.	617.	COAL	617.	10	-0.02	0.30	0.03
10 FCMCCL FUEL-CL-MO HEAT	0.	17.	34.	16.	10.	3.	0.	554.	34.	COAL	588.	10	0.03	0.02	0.03
11 FCSTCL FUEL-CL-ST POWR	0.	70.	535.	229.	188.	55.	-251.	0.	535.	COAL	535.	10	0.12	0.35	0.03
11 FCSTCL FUEL-CL-ST HEAT	0.	22.	37.	16.	13.	4.	0.	546.	37.	COAL	583.	10	0.04	0.02	0.03
12 IGGTST INT-GAS-GT POWR	0.	-147.	752.	346.	188.	55.	-389.	0.	752.	COAL	752.	10	-0.24	0.25	0.02
12 IGGTST INT-GAS-GT HEAT	0.	11.	35.	16.	9.	3.	0.	559.	35.	COAL	594.	10	0.02	0.01	0.03
13 GTSOAR GT-HRSG-10 POWR	0.	-42.	647.	257.	188.	55.	-284.	0.	647.	RESIDUAL	647.	0	-0.07	0.29	0.02
13 GTSOAR GT-HRSG-10 HEAT	0.	15.	40.	16.	12.	3.	0.	550.	40.	RESIDUAL	590.	10	0.02	0.02	0.03
14 GTAC08 GT-HRSG-08 POWR	0.	-90.	695.	359.	188.	55.	-403.	0.	695.	RESIDUAL	695.	0	-0.15	0.27	0.02
14 GTAC08 GT-HRSG-08 HEAT	0.	14.	31.	16.	8.	2.	0.	560.	31.	RESIDUAL	591.	10	0.02	0.01	0.03
15 GTAC12 GT-HRSG-12 POWR	0.	-10.	615.	285.	188.	55.	-316.	0.	615.	RESIDUAL	615.	0	-0.02	0.31	0.03
15 GTAC12 GT-HRSG-12 HEAT	0.	17.	35.	16.	11.	3.	0.	553.	35.	RESIDUAL	588.	10	0.03	0.02	0.03
16 GTAC16 GT-HRSG-16 POWR	0.	24.	581.	246.	188.	55.	-271.	0.	581.	RESIDUAL	581.	0	0.04	0.32	0.03
16 GTAC16 GT-HRSG-16 HEAT	0.	19.	38.	16.	12.	4.	0.	548.	38.	RESIDUAL	586.	10	0.03	0.02	0.03
17 GTWC16 GT-HRSG-16 POWR	0.	10.	596.	241.	188.	55.	-265.	0.	596.	RESIDUAL	596.	0	0.02	0.32	0.03
17 GTWC16 GT-HRSG-16 HEAT	0.	18.	39.	16.	12.	4.	0.	548.	39.	RESIDUAL	587.	10	0.03	0.02	0.03

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28213 MW 55.00 PROCESS MILLIONS BTU/HR 16.0 PROCESS TEMP(F) 448. PRODUCT LOW-DENSITY- HOURS PER YEAR 7000.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FE[illegible]	POWER FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	0.	72.	534.	179.	188.	55.	-192.	0.	534.	RESIDUAL	534.	0	0.12	0.35	0.03
18	CC1626	GTST-16/26	HEAT	0.	24.	48.	16.	17.	5.	0.	534.	48.	RESIDUAL	582.	10	0.04	0.03	0.03
19	CC1622	GTST-16/22	POWR	0.	61.	545.	200.	188.	55.	-217.	0.	545.	RESIDUAL	545.	0	0.10	0.34	0.03
19	CC1622	GTST-16/22	HEAT	0.	22.	44.	16.	15.	4.	0.	540.	44.	RESIDUAL	583.	10	0.04	0.03	0.03
20	CC1222	GTST-12/22	POWR	0.	61.	544.	202	188.	55.	-219.	0.	544.	RESIDUAL	544.	0	0.10	0.34	0.03
20	CC1222	GTST-12/22	HEAT	0.	22.	43.	16.	15.	4.	0.	540.	43.	RESIDUAL	583.	10	0.04	0.03	0.03
21	CC0822	GTST-08/22	POWR	0.	14.	591.	260.	188.	55.	-287.	0.	591.	RESIDUAL	591.	0	0.02	0.32	0.03
21	CC0822	GTST-08/22	HEAT	0.	19.	36.	16.	12.	3.	0.	550.	36.	RESIDUAL	587.	10	0.03	0.02	0.03
22	STIG15	STIG-15-16	POWR	0.	101.	493.	6.	188.	55.	11.	0.	504.	RESIDUAL	504.	1	0.17	0.37	0.03
22	STIG15	STIG-15-16	HEAT	0.	253.	1231.	16.	469.	137.	0.	-879.	1231.	RESIDUAL	352.	1	0.17	0.36	0.01
23	STIG10	STIG-10-16	POWR	0.	83.	523.	69.	188.	55.	-63.	0.	523.	RESIDUAL	523.	1	0.14	0.36	0.03
23	STIG10	STIG-10-16	HEAT	0.	34.	121.	16.	43.	13.	0.	451.	121.	RESIDUAL	572.	11	0.06	0.08	0.03
24	STIG1S	STIG-1S-16	POWR	0.	45.	560.	118.	188.	55.	-120.	0.	560.	RESIDUAL	560.	1	0.08	0.34	0.03
24	STIG1S	STIG-1S-16	HEAT	0.	22.	76.	16.	25.	7.	0.	507.	76.	RESIDUAL	583.	11	0.04	0.04	0.03
25	DEADV3	DIESEL-ADV	POWR	0.	99.	506.	86.	188.	55.	-83.	0.	506.	RESIDUAL	506.	0	0.16	0.37	0.03
25	DEADV3	DIESEL-ADV	HEAT	0.	34.	94.	16.	35.	10.	0.	478.	94.	RESIDUAL	571.	0	0.06	0.06	0.03
26	DEADV2	DIESEL-ADV	POWR	0.	99.	506.	128.	188.	55.	-132.	0.	506.	RESIDUAL	506.	1	0.16	0.37	0.03
26	DEADV2	DIESEL-ADV	HEAT	0.	29.	63.	16.	23.	7.	0.	513.	63.	RESIDUAL	576.	1	0.05	0.04	0.03
27	DEADV1	DIESEL-ADV	POWR	0.	99.	506.	198.	188.	55.	-214.	0.	506.	RESIDUAL	506.	1	0.16	0.37	0.03
27	DEADV1	DIESEL-ADV	HEAT	0.	25.	41.	16.	15.	4.	0.	539.	41.	RESIDUAL	580.	1	0.04	0.03	0.03
28	DEHTPM	ADV-DIESEL	POWR	0.	-37.	643.	276.	188.	55.	-305.	0.	643.	RESIDUAL	643.	0	-0.06	0.29	0.02
28	DEHTPM	ADV-DIESEL	HEAT	0.	16.	37.	16.	11.	3.	0.	552.	37.	RESIDUAL	590.	0	0.03	0.02	0.03
29	DESOA3	DIESEL-SOA	POWR	0.	85.	520.	71.	188.	55.	-65.	0.	520.	DISTILLA	520.	0	0.14	0.36	0.03
29	DESOA3	DIESEL-SOA	HEAT	0.	34.	117.	16.	42.	12.	0.	454.	117.	DISTILLA	571.	0	0.06	0.07	0.03
29	DESOA3	DIESEL-SOA	POWR	0.	85.	520.	71.	188.	55.	-65.	0.	520.	RESIDUAL	520.	0	0.14	0.36	0.03
29	DESOA3	DIESEL-SOA	HEAT	0.	34.	117.	16.	42.	12.	0.	454.	117.	RESIDUAL	571.	0	0.06	0.07	0.03

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28213 MW 55.00 PROCESS MILLIONS BTU/HR 16.0 PROCESS TEMP(F) 448. PRODUCT LOW-DENSITY- HOURS PER YEAR 7900.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	85.	520.	114.	188.	55.	-116.	0.	520.	DISTILLA	520.	1	0.14	0.36	0.03
30 DESOA2 DIESEL-SOA HEAT	0.	28.	73.	16.	26.	8.	0.	504.	73.	DISTILLA	577.	1	0.05	0.05	0.03
30 DESOA2 DIESEL-SOA POWR	0.	85.	520.	114.	188.	55.	-116.	0.	520.	RESIDUAL	520.	1	0.14	0.36	0.03
30 DESOA2 DIESEL-SOA HEAT	0.	28.	73.	16.	26.	8.	0.	504.	73.	RESIDUAL	577.	1	0.05	0.05	0.03
31 DESOA1 DIESEL-SOA POWR	0.	85.	520.	208.	188.	55.	-226.	0.	520.	DISTILLA	520.	1	0.14	0.36	0.03
31 DESOA1 DIESEL-SOA HEAT	0.	24.	40.	16.	14.	4.	0.	541.	40.	DISTILLA	581.	1	0.04	0.02	0.03
31 DESOA1 DIESEL-SOA POWR	0.	85.	520.	208.	188.	55.	-226.	0.	520.	RESIDUAL	520.	1	0.14	0.36	0.03
31 DESOA1 DIESEL-SOA HEAT	0.	24.	40.	16.	14.	4.	0.	541.	40.	RESIDUAL	581.	1	0.04	0.02	0.03
32 GTSOAD GT-HRSG-10 POWR	0.	-37.	643.	292.	188.	55.	-325.	0.	643.	DISTILLA	643.	0	-0.06	0.29	0.02
32 GTSOAD GT-HRSG-10 HEAT	0.	16.	35.	16.	10.	3.	0.	554.	35.	DISTILLA	590.	10	0.03	0.02	0.03
33 GTRA08 GT-85RE-08 POWR	0.	80.	526.	156.	188.	55	-165.	0.	526.	DISTILLA	526.	0	0.13	0.36	0.03
33 GTRA08 GT-85RE-08 HEAT	0.	25.	54.	16.	19.	6.	0.	526.	54.	DISTILLA	580.	10	0.04	0.03	0.03
34 GTRA12 GT-85RE-12 POWR	0.	81.	524.	164.	188.	55.	-175.	0.	524.	DISTILLA	524.	0	0.13	0.36	0.03
34 GTRA12 GT-85RE-12 HEAT	0.	25.	51.	16.	18.	5.	0.	529.	51.	DISTILLA	580.	10	0.04	0.03	0.03
35 GTRA16 GT-85RE-16 POWR	0.	68.	538.	180.	188.	55.	-193.	0.	538.	DISTILLA	538.	0	0.11	0.35	0.03
35 GTRA16 GT-85RE-16 HEAT	0.	23.	48.	16.	17.	5.	0.	534.	48.	DISTILLA	582.	10	0.04	0.03	0.03
36 GTR208 GT-60RE-08 POWR	0.	19.	586.	224.	188.	55.	-244.	0.	586.	DISTILLA	586.	0	0.03	0.32	0.03
36 GTR208 GT-60RE-08 HEAT	0.	19.	42.	16.	13.	4.	0.	544.	42.	DISTILLA	586.	10	0.03	0.02	0.03
37 GTR212 GT-60RE-12 POWR	0.	37.	569.	208.	188.	55.	-226.	0.	569.	DISTILLA	569.	0	0.06	0.33	0.03
37 GTR212 GT-60RE-12 HEAT	0	20.	44.	16.	14.	4.	0.	541.	44.	DISTILLA	585.	10	0.03	0.02	0.03
38 GTR216 GT-60RE-16 POWR	0.	48.	557.	202.	188.	55.	-219.	0.	557.	DISTILLA	557.	0	0.08	0.34	0.03
38 GTR216 GT-60RE-16 HEAT	0.	21.	44.	16.	15.	4.	0.	540.	44.	DISTILLA	584.	10	0.03	0.03	0.03
39 GTRW08 GT-85RE-08 POWR	0.	71.	535.	133.	188.	55.	-138.	0.	535.	DISTILLA	535.	0	0.12	0.35	0.03
39 GTRW08 GT-85RE-08 HEAT	0.	25.	64.	16.	23	7.	0.	516.	64.	DISTILLA	580.	10	0.04	0.04	0.03
40 GTRW12 GT-85RE-12 POWR	0.	90.	516.	134.	188.	55.	-139.	0.	516.	DISTILLA	516.	0	0.15	0.36	0.03
40 GTRW12 GT-85RE-12 HEAT	0.	27.	62.	16.	22.	7.	0.	516.	62.	DISTILLA	578.	10	0.05	0.04	0.03

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28213 MW 55.00 PROCESS MILLIONS BTU/HR 16.0 PROCESS TEMP(F) 448. PRODUCT LOW-DENSITY- HOURS PER YEAR 7900.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	80.	526.	148.	188.	55.	-155.	0.	526.	DISTILLA	526.	0	0.13	0.36	0.03
41 GTRW16 GT-85RE-16 HEAT	0.	25.	57.	16.	20.	6.	0.	523.	57.	DISTILLA	580.	10	0.04	0.04	0.03
42 GTR308 GT-60RE-08 POWR	0.	-0.	605.	177.	188.	55.	-190.	0.	605.	DISTILLA	605.	0	-0.00	0.31	0.03
42 GTR308 GT-60RE-08 HEAT	0.	17.	55.	16.	17.	5.	0.	533.	55.	DISTILLA	588.	10	0.03	0.03	0.03
43 GTR312 GT-60RE-12 POWR	0.	57.	549.	176.	188.	55.	-188.	0.	549.	DISTILLA	549.	0	0.09	0.34	0.03
43 GTR312 GT-60RE-12 HEAT	0.	22.	50.	16.	17.	5.	0.	533.	50.	DISTILLA	583.	10	0.04	0.03	0.03
44 GTR316 GT-60RE-16 POWR	0.	52.	554.	179.	188.	55.	-192.	0.	554.	DISTILLA	554.	0	0.09	0.34	0.03
44 GTR316 GT-60RE-16 HEAT	0.	22.	49.	16.	17.	5.	0.	534.	49.	DISTILLA	583.	10	0.04	0.03	0.03
45 FCPADS FUEL-CL-PH POWR	0.	111.	494.	84.	188.	55.	-80.	0.	494.	DISTILLA	494.	0	0.18	0.38	0.03
45 FCPADS FUEL-CL-PH HEAT	0.	36.	94.	16.	36.	10.	0.	475.	94.	DISTILLA	569.	0	0.06	0.06	0.03
46 FCMCDS FUEL-CL-MO POWR	0.	150.	455.	106.	188.	55.	-106.	0.	455.	DISTILLA	455.	0	0.25	0.41	0.04
46 FCMCDS FUEL-CL-MO HEAT	0.	39.	69.	16.	28.	6.	0.	498.	69.	DISTILLA	567.	0	0.06	0.05	0.03

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28221 MW 7.50 PROCESS MILLIONS BTU/HR 35.0 PROCESS TEMP(F) 338. PRODUCT STYRENE-BUTA HOURS PER YEAR 7000.

POWER TO HEAT RATIO 0.731

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	41.	80.	41.	COAL-AFB	121	0	0.	0.21	0.29
1	STM141	STM-TURB-1	POWR	0.	-53.	175.	123.	26.	8.	-103.	0.	175.	RESIDUAL	175.	0	-0.44	0.15	0.20
1	STM141	STM-TURB-1	HEAT	0.	14.	50.	35.	7.	2.	0.	57.	50.	RESIDUAL	107.	10	0.12	0.07	0.33
1	STM141	STM-TURB-1	POWR	0.	-53.	175.	123.	26.	8.	-103.	0.	175.	COAL-FGD	175.	0	-0.44	0.15	0.20
1	STM141	STM-TURB-1	HEAT	0.	14.	50.	35.	7.	2.	0.	57.	50.	COAL-FGD	107.	10	0.12	0.07	0.33
1	STM141	STM-TURB-1	POWR	0.	-53.	175.	123.	26.	8.	-103.	0.	175.	COAL-AFB	175.	0	-0.44	0.15	0.20
1	STM141	STM-TURB-1	HEAT	0.	14.	50.	35.	7.	2.	0.	57.	50.	COAL-AFB	107.	10	0.12	0.07	0.33
2	STM088	STM-TURB-8	POWR	0.	-107.	229.	169.	26.	8.	-157.	0.	229.	RESIDUAL	229.	0	-0.89	0.11	0.15
2	STM088	STM-TURB-8	HEAT	0.	10.	47.	35.	5.	2.	0.	63.	47.	RESIDUAL	111.	10	0.09	0.05	0.32
2	STM088	STM-TURB-8	POWR	0.	-107.	229.	169.	26.	8.	-157.	0.	229.	COAL-FGD	229.	0	-0.89	0.11	0.15
2	STM088	STM-TURB-8	HEAT	0.	10.	47.	35.	5.	2.	0.	63.	47.	COAL-FGD	111.	10	0.09	0.05	0.32
2	STM088	STM-TURB-8	POWR	0.	-107.	229.	169.	26.	8.	-157.	0.	229.	COAL-AFB	229.	0	-0.89	0.11	0.15
2	STM088	STM-TURB-8	HEAT	0.	10.	47.	35.	5.	2.	0.	63.	47.	COAL-AFB	111.	10	0.09	0.05	0.32
3	PFBSTM	PFB-STMTB-	POWR	0.	1.	120.	76.	26.	8.	-48.	0.	120.	COAL-PFB	120.	10	0.01	0.21	0.29
3	PFBSTM	PFB-STMTB-	HEAT	0.	23.	56.	35.	12.	3.	0.	43.	56.	COAL-PFB	99.	10	0.19	0.12	0.35
4	TISTMT	TI-STMTB-1	POWR	0.	23.	98.	57.	26.	8.	-26.	0.	98.	RESIDUAL	98.	10	0.19	0.26	0.36
4	TISTMT	TI-STMTB-1	HEAT	0.	30.	60.	35.	16.	5.	0.	31.	60.	RESIDUAL	91.	10	0.25	0.17	0.38
4	TISTMT	TI-STMTB-1	POWR	0.	23.	98.	57.	26.	8.	-26.	0.	98.	COAL	98.	10	0.19	0.26	0.36
4	TISTMT	TI-STMTB-1	HEAT	0.	30.	60.	35.	16.	5.	0.	31.	60.	COAL	91.	10	0.25	0.17	0.38
5	TIHRSG	THERMIONIC	POWR	0.	-61.	182.	119.	26.	8.	-99.	0.	182.	RESIDUAL	182.	0	-0.50	0.14	0.19
5	TIHRSG	THERMIONIC	HEAT	0.	11.	53.	35.	8.	2.	0.	56.	53.	RESIDUAL	110.	10	0.09	0.07	0.32
5	TIHRSG	THERMIONIC	POWR	0.	-61.	182.	119.	26.	8.	-99.	0.	182.	COAL	182.	0	-0.50	0.14	0.19
5	TIHRSG	THERMIONIC	HEAT	0.	11.	53.	35.	8.	2.	0.	56.	53.	COAL	110.	10	0.09	0.07	0.32
6	STIRL	STIRLING-1	POWR	0.	22.	99.	47.	26.	8.	-14.	0.	99.	DISTILLA	99.	0	0.18	0.26	0.35
6	STIRL	STIRLING-1	HEAT	0.	27.	74.	35.	19.	6.	0.	20.	74.	DISTILLA	94.	0	0.22	0.20	0.37

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28221 MW 7.50 PROCESS MILLIONS BTU/HR 35.0 PROCESS TEMP(F) 338. PRODUCT STYRENE-BUTA HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.731

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	22.	99.	47.	26.	8.	-14.	0.	99.	RESIDUAL	99.	0	0.18	0.26	0.35
6 STIRL STIRLING-1 HEAT	0.	27.	74.	35.	19.	6.	0.	20.	74.	RESIDUAL	94.	0	0.22	0.20	0.37
6 STIRL STIRLING-1 POWR	0.	22.	99.	47.	26.	8.	-14.	0.	99.	COAL	99.	0	0.18	0.26	0.35
6 STIRL STIRLING-1 HEAT	0.	27.	74.	35.	19.	6.	0.	20.	74.	COAL	94.	0	0.22	0.20	0.37
7 HEGT85 HELIUM-GT- POWR	0.	15.	80.	13.	26.	8.	26.	0.	106.	COAL-AFB	106.	10	0.13	0.24	0.33
7 HEGT85 HELIUM-GT- HEAT	0.	42.	219.	35.	70.	21.	0.	-140.	219.	COAL-AFB	79.	10	0.16	0.32	0.16
8 HEGT60 HELIUM-GT- POWR	0.	18.	99.	31.	26.	8.	4.	0.	103.	COAL-AFB	103.	10	0.15	0.25	0.34
8 HEGT60 HELIUM-GT- HEAT	0.	20.	111.	35.	29.	8.	0.	-10.	111.	COAL-AFB	101.	10	0.15	0.26	0.32
9 HEGT00 HELIUM-GT- POWR	0.	-24.	145.	72.	26.	8.	-44.	0.	145.	COAL-AFB	145.	10	-0.20	0.18	0.24
9 HEGT00 HELIUM-GT- HEAT	0.	9.	71.	35.	12.	4.	0.	41.	71.	COAL-AFB	112.	10	0.08	0.11	0.31
10 FCMCCL FUEL-CL-MO POWR	0.	37.	84.	40.	26.	8.	-6.	0.	84.	COAL	84.	10	0.31	0.30	0.42
10 FCMCCL FUEL-CL-MO HEAT	0.	37.	74.	35.	22.	7.	0.	10.	74.	COAL	84.	10	0.31	0.27	0.42
11 FCSTCL FUEL-CL-ST POWR	0.	44.	66.	26.	26.	8.	10.	0.	77.	COAL	77.	10	0.37	0.33	0.46
11 FCSTCL FUEL-CL-ST HEAT	0.	59.	89.	35.	34.	10	0.	-27.	89.	COAL	62.	10	0.40	0.39	0.39
12 IGGTST INT-GAS-GT POWR	0.	32.	89.	38.	26.	8.	-3.	0.	89.	COAL	89.	10	0.27	0.29	0.39
12 IGGTST INT-GAS-GT HEAT	0.	33.	83.	35.	24.	7.	0.	6.	83.	COAL	88.	10	0.27	0.27	0.40
13 GTSOAR GT-HRSG-10 POWR	0.	33.	88.	38.	26.	8.	-4.	0.	88.	RESIDUAL	88.	10	0.27	0.29	0.40
13 GTSOAR GT-HRSG-10 HEAT	0.	34.	81.	35.	23.	7.	0.	7.	81.	RESIDUAL	88.	10	0.28	0.27	0.40
14 GTAC08 GT-HRSG-08 POWR	0.	26.	95.	49.	26.	8.	-16.	0.	95.	RESIDUAL	95.	10	0.22	0.27	0.37
14 GTAC08 GT-HRSG-08 HEAT	0.	31.	68.	35.	18.	5.	0.	22.	68.	RESIDUAL	91.	10	0.25	0.20	0.39
15 GTAC12 GT-HRSG-12 POWR	0.	37.	84.	39.	26.	8.	-5.	0.	84.	RESIDUAL	84.	10	0.31	0.31	0.42
15 GTAC12 GT-HRSG-12 HEAT	0.	38.	75.	35.	23.	7.	0.	8.	75.	RESIDUAL	83.	10	0.31	0.27	0.42
16 GTAC16 GT-HRSG-16 POWR	0.	41.	79.	35.	26.	8.	1.	0.	80.	RESIDUAL	80.	10	0.34	0.32	0.44
16 GTAC16 GT-HRSG-16 HEAT	0.	42.	80.	35.	26.	8.	0.	-1.	80.	RESIDUAL	79.	10	0.34	0.32	0.44
17 GTWC16 GT-HRSG-16 POWR	0.	37.	81.	33.	26.	8.	3.	0.	84.	RESIDUAL	84.	10	0.31	0.31	0.42
17 GTWC16 GT-HRSG-16 HEAT	0.	40.	87.	35.	27.	8.	0.	-5.	87.	RESIDUAL	81.	10	0.32	0.32	0.40

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28221 MW 7.50 PROCESS MILLIONS BTU/HR 35.0 PROCESS TEMP(F) 338. PRODUCT STYRENE-BUTA HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.731

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	37.	67.	21.	26.	8.	17.	0.	84.	RESIDUAL	84.	10	0.31	0.30	0.42
18 CC1626 GTST-16/26 HEAT	0.	62.	114.	35.	43.	13.	0.	-55.	114.	RESIDUAL	59.	10	0.35	0.38	0.31
19 CC1622 GTST-16/22 POWR	0.	39.	68.	23.	26.	8.	14.	0.	82.	RESIDUAL	82.	10	0.32	0.31	0.42
19 CC1622 GTST-16/22 HEAT	0.	59.	104.	35.	39.	11.	0.	-41.	104.	RESIDUAL	62.	10	0.36	0.37	0.34
20 CC1222 GTST-12/22 POWR	0.	39.	68.	23.	26.	8.	14.	0.	82.	RESIDUAL	82.	10	0.32	0.31	0.43
20 CC1222 GTST-12/22 HEAT	0.	59.	103.	35.	39.	11.	0.	-41.	103.	RESIDUAL	62.	10	0.37	0.38	0.34
21 CC0822 GTST-08/22 POWR	0.	42.	72.	29.	26.	8.	7.	0.	79.	RESIDUAL	79.	10	0.35	0.32	0.44
21 CC0822 GTST-08/22 HEAT	0.	50.	87.	35.	31.	9.	0.	-16.	87.	RESIDUAL	71.	10	0.37	0.35	0.40
22 STIG15 STIG-15-16 POWR	0.	14.	67.	1.	26.	8.	40.	0.	107.	RESIDUAL	107.	10	0.11	0.24	0.33
22 STIG15 STIG-15-16 HEAT	0.	554.	2692.	35.	1026.	301.	0.	-3126.	2692.	RESIDUAL	-433.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	20.	71.	9.	26.	8.	30.	0.	101.	RESIDUAL	101.	10	0.16	0.25	0.35
23 STIG10 STIG-10-16 HEAT	0.	73.	264.	35.	95.	28.	0.	-216.	264.	RESIDUAL	48.	0	0.22	0.36	0.13
24 STIGIS STIG-IS-16 POWR	0.	23.	76.	16.	26.	8.	22.	0.	99.	RESIDUAL	99.	10	0.19	0.26	0.36
24 STIGIS STIG-IS-16 HEAT	0.	49.	166.	35.	56.	16.	0.	-94.	166.	RESIDUAL	72.	10	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	29.	69.	15.	26.	8.	24.	0.	93.	RESIDUAL	93.	0	0.24	0.28	0.38
25 DEADV3 DIESEL-ADV HEAT	0.	67.	161.	35.	60.	18.	0.	-107.	161.	RESIDUAL	54.	0	0.29	0.37	0.22
26 DEADV2 DIESEL-ADV POWR	0.	32.	69.	18.	26.	8.	21.	0.	90.	RESIDUAL	90.	1	0.26	0.29	0.39
26 DEADV2 DIESEL-ADV HEAT	0.	63.	138.	35.	51.	15.	0.	-80.	138.	RESIDUAL	58.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	43.	69.	27.	26.	8.	9.	0.	78.	RESIDUAL	78.	1	0.35	0.33	0.45
27 DEADV1 DIESEL-ADV HEAT	0.	55.	90.	35.	33.	10.	0.	-24.	90.	RESIDUAL	66.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	42.	76.	33.	26.	8.	3.	0.	79.	RESIDUAL	79.	0	0.35	0.33	0.44
28 DEHTPM ADV-DIESEL HEAT	0.	46.	81.	35.	27.	8.	0.	-6.	81.	RESIDUAL	76.	0	0.36	0.34	0.43
29 DESOA3 DIESEL-SOA POWR	0.	24.	71.	13.	26.	8.	26.	0.	97.	DISTILLA	97.	0	0.20	0.26	0.36
29 DESOA3 DIESEL-SOA HEAT	0.	66.	191.	35.	69.	20.	0.	-136.	191.	DISTILLA	55.	0	0.26	0.36	0.18
29 DESOA3 DIESEL-SOA POWR	0.	24.	71.	13.	26	8.	26.	0.	97.	RESIDUAL	97.	0	0.20	0.26	0.36
29 DESOA3 DIESEL-SOA HEAT	0.	66.	191.	35.	69.	20.	0.	-136.	191.	RESIDUAL	55.	0	0.26	0.36	0.18

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28221 MW 7.50 PROCESS MILLIONS BTU/HR 35.0 PROCESS TEMP(F) 338. PRODUCT STYRENE-BUTA HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.731

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	27.	71.	16.	26.	8.	23.	0.	94.	DISTILLA	94.	1	0.23	0.27	0.37
30	DESOA2	DIESEL-SOA	HEAT	0.	62.	159.	35.	57.	17.	0.	-100.	159.	DISTILLA	60.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	27.	71.	16.	26.	8.	23.	0.	94.	RESIDUAL	94.	1	0.23	0.27	0.37
30	DESOA2	DIESEL-SOA	HEAT	0.	62.	159.	35.	57.	17.	0.	-100.	159.	RESIDUAL	60.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	43.	71.	28.	26.	8.	8.	0.	79.	DISTILLA	79.	1	0.35	0.33	0.45
31	DESOA1	DIESEL-SOA	HEAT	0.	52.	87.	35.	32.	9.	0.	-1[illegible]	[illegible]7.	DISTILLA	69.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	43.	71.	28.	26.	8.	8.	0.	79.	RESIDUAL	79.	1	0.35	0.33	0.45
31	DESOA1	DIESEL-SOA	HEAT	0.	52.	87.	35.	32.	9.	0.	-18.	87.	RESIDUAL	69.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	34.	88.	41.	26.	8.	-7.	0.	88.	DISTILLA	88.	10	0.28	0.29	0.40
32	GTSOAD	GT-HRSG-10	HEAT	0.	35.	75.	35.	22.	6.	0.	11.	75.	DISTILLA	87.	10	0.29	0.25	0.40
33	GTRA08	GT-85RE-08	POWR	0.	38.	72.	25.	26.	8.	12.	0.	84.	DISTILLA	84.	10	0.31	0.31	0.42
33	GTRA08	GT-85RE-08	HEAT	0.	53.	101.	35.	36.	11.	0.	-32.	101.	DISTILLA	68.	10	0.34	0.36	0.35
34	GTRA12	GT-85RE-12	POWR	0.	38.	71.	25.	26.	8.	11.	0.	83.	DISTILLA	83.	10	0.32	0.31	0.42
34	GTRA12	GT-85RE-12	HEAT	0.	53.	98.	35.	35.	10.	0.	-30.	98.	DISTILLA	68.	10	0.35	0.36	0.36
35	GTRA16	GT-85RE-16	POWR	0.	39.	73.	27.	26.	8.	9.	0.	83.	DISTILLA	83.	10	0.32	0.31	0.42
35	GTRA16	GT-85RE-16	HEAT	0.	50.	94.	35.	33.	10.	0.	-23.	94.	DISTILLA	71.	10	0.35	0.35	0.37
36	GTR208	GT-60RE-08	POWR	0.	38.	80.	33.	26.	8.	3.	0.	83.	DISTILLA	83.	10	0.32	0.31	0.42
36	GTR208	GT-60RE-08	HEAT	0.	41.	86.	35.	27.	8.	0.	-6.	86.	DISTILLA	80.	10	0.32	0.32	0.41
37	GTR212	GT-60RE-12	POWR	0.	38.	78.	30.	26.	8.	5.	0.	83.	DISTILLA	83.	10	0.32	0.31	0.42
37	GTR212	GT-60RE-12	HEAT	0.	44.	89.	35.	29.	9.	0.	-12.	89.	DISTILLA	77.	10	0.33	0.33	0.39
38	GTR216	GT-60RE-16	POWR	0.	39.	76.	30.	26.	8.	6.	0.	82.	DISTILLA	82.	10	0.32	0.31	0.43
38	GTR216	GT-60RE-16	HEAT	0.	46.	89.	35.	30.	9.	0.	-14.	89.	DISTILLA	75.	10	0.34	0.34	0.39
39	GTRW08	GT-85RE-08	POWR	0.	32.	73.	21.	26.	8.	17.	0.	90.	DISTILLA	90.	10	0.26	0.29	0.39
39	GTRW08	GT-85RE-08	HEAT	0.	53.	122.	35.	43.	13.	0.	-54.	122.	DISTILLA	68.	10	0.30	0.35	0.29
40	GTRW12	GT-85RE-12	POWR	0.	34.	70.	20.	26	8.	17.	0.	87.	DISTILLA	87.	10	0.28	0.29	0.40
40	GTRW12	GT-85RE-12	HEAT	0.	58.	120.	35.	44.	13.	0.	-57.	120.	DISTILLA	63.	10	0.32	0.36	0.29

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 2822: MW 7.50 PROCESS MILLIONS BTU/HR 35.0 PROCESS TEMP(F) 338. PRODUCT STYRENE-BUTA HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.731

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	34.	72.	22.	26.	8.	15.	0.	87.	DISTILLA	87.	10	0.28	0.29	0.40
41 GTRW16 GT-85RE-16 HEAT	0.	54.	114.	35.	41.	12.	0.	-47.	114.	DISTILLA	67.	10	0.32	0.36	0.31
42 GTR308 GT-60RE-08 POWR	0.	30.	83.	27.	26.	8.	9.	0.	92.	DISTILLA	92.	10	0.24	0.28	0.38
42 GTR308 GT-60RE-08 HEAT	0.	38.	106.	35.	33.	10.	0.	-23.	106.	DISTILLA	83.	10	0.26	0.31	0.33
43 GTR312 GT-60RE-12 POWR	0.	35.	75.	25.	26.	8.	12.	0.	86.	DISTILLA	86.	10	0.29	0.30	0.40
43 GTR312 GT-60RE-12 HEAT	0.	48.	104.	35.	36.	10.	0.	-32.	104.	DISTILLA	73.	10	0.32	0.34	0.34
44 GTR316 GT-60RE-16 POWR	0.	34.	75.	25.	26.	8.	11.	0.	87.	DISTILLA	87.	10	0.28	0.30	0.40
44 GTR316 GT-60RE-16 HEAT	0.	47.	104.	35.	35.	10.	0.	-30.	104.	DISTILLA	74.	10	0.31	0.34	0.34
45 FCPADS FUEL-CL-PH POWR	0.	26.	67.	11.	26.	8.	28.	0.	95.	DISTILLA	95.	0	0.22	0.27	0.37
45 FCPADS FUEL-CL-PH HEAT	0.	80.	206.	35.	78.	23.	0.	-165.	206.	DISTILLA	41.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	35.	62.	14.	26.	8.	24.	0.	86.	DISTILLA	86.	0	0.29	0.30	0.41
46 FCMCDS FUEL-CL-MO HEAT	0.	84.	150.	35.	62.	18.	0.	-113.	150.	DISTILLA	37.	0	0.36	0.41	0.23

DATE 06/06/79 GENERAL ELECTRIC COMPANY

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28241 MW 32.00 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 406. PRODUCT POLYESTER HOURS PER YEAR 7900.

POWER TO HEAT RATIO 3.639

UTILITY FUEL COAL WASTE FUEL EQV BTUx10xx6= 0. HOT WATER BTUx10xx6= 0.

				WASTE FUEL USED 10xx6 BTU/HR	FUEL SAVED= NO-NET 10xx6 BTU/HR	COGEN FUEL USED 10xx6 BTU/HR	COGEN PROCES HEAT 10xx6 BTU/HR	COGEN PROCES POWER 10xx6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10xx6 BTU/HR	UTILIT FUEL USED 10xx6 BTU/HR	TOTAL FUEL SITE 10xx6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10xx6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	35.	341.	35	RESIDUAL	376.	0	0	0.29	0.08
1	STM141	STM-TURB-1	POWR	0.	-640.	1016.	755.	109.	32.	-853.	0.	1016	RESIDUAL	1016.	0	-1.70	0.11	0.03
1	STM141	STM-TURB-1	HEAT	0.	8.	40.	30.	4.	1.	0.	328.	40	RESIDUAL	368.	10	0.02	0.01	0.08
1	STM141	STM-TURB-1	POWR	0.	-640.	1016.	755.	109.	32.	-853.	0.	1016	COAL-FGD	1016.	0	-1.70	0.11	0.03
1	STM141	STM-TURB-1	HEAT	0.	8.	40	30.	4.	1.	0.	328.	40	COAL-FGD	368.	10	0.02	0.01	0.08
1	STM141	STM-TURB-1	POWR	0.	-640.	1016.	755.	109.	32.	-853.	0.	1016	COAL-AFB	1016.	0	-1.70	0.11	0.03
1	STM141	STM-TURB-1	HEAT	0.	8.	40.	30.	4.	1.	0.	328.	40	COAL-AFB	368.	10	0.02	0.01	0.08
2	STM088	STM-TURB-8	POWR	0.	-1143.	1519.	1182.	109.	32.	-1356.	0.	1519	RESIDUAL	1519.	0	-3.04	0.07	0.02
2	STM088	STM-TURB-8	HEAT	0.	5.	39.	30.	3.	1.	0.	333.	39	RESIDUAL	371.	10	0.01	0.01	0.08
2	STM088	STM-TURB-8	POWR	0.	-1143.	1519.	1182.	109.	32.	-1356.	0.	1519	COAL-FGD	1519.	0	-3.04	0.07	0.02
2	STM088	STM-TURB-8	HEAT	0.	5.	39.	30.	3.	1.	0.	333.	39	COAL-FGD	371.	10	0.01	0.01	0.08
2	STM088	STM-TURB-8	POWR	0.	-1143.	1519.	1182.	109.	32.	-1356.	0.	1519	COAL-AFB	1519.	0	-3.04	0.07	0.02
2	STM088	STM-TURB-8	HEAT	0.	5.	39.	30.	3.	1.	0.	333.	39	COAL-AFB	371.	10	0.01	0.01	0.08
3	PFBSTM	PFB-STMTB-	POWR	0.	-236.	613.	405.	109.	32.	-442.	0.	613	COAL-PFB	613.	0	-0.63	0.18	0.05
3	PFBSTM	PFB-STMTB-	HEAT	0.	15.	45.	30.	8.	2.	0.	316.	45	COAL-PFB	361.	10	0.04	0.02	0.08
4	TISTMT	TI-STMTB-1	POWR	0.	-100.	477.	293.	109.	32.	-309.	0.	477	RESIDUAL	477.	0	-0.27	0.23	0.06
4	TISTMT	TI-STMTB-1	HEAT	0.	21.	49.	30.	11.	3.	0.	306.	49	RESIDUAL	355.	10	0.06	0.03	0.08
4	TISTMT	TI-STMTB-1	POWR	0.	-100.	477.	293.	109.	32.	-309.	0.	477	COAL	477.	0	-0.27	0.23	0.06
4	TISTMT	TI-STMTB-1	HEAT	0.	21.	49.	30.	11.	3.	0.	306.	49	COAL	355.	10	0.06	0.03	0.08
5	TIHRSG	THERMIONIC	POWR	0.	-400.	776.	490.	109.	32.	-541.	0.	776	RESIDUAL	776.	0	-1.06	0.14	0.04
5	TIHRSG	THERMIONIC	HEAT	0.	9.	47.	30.	7.	2.	0.	320.	47	RESIDUAL	368.	10	0.02	0.02	0.08
5	TIHRSG	THERMIONIC	POWR	0.	-400.	776.	490.	109.	32.	-541.	0.	776	COAL	776.	0	-1.06	0.14	0.04
5	TIHRSG	THERMIONIC	HEAT	0.	9.	47.	30.	7.	2.	0.	320.	47	COAL	368.	10	0.02	0.02	0.08
6	STIRL	STIRLING-1	POWR	0.	-75.	451.	220.	109.	32.	-223.	0.	451	DISTILLA	451.	0	-0.20	0.24	0.07
6	STIRL	STIRLING-1	HEAT	0.	20.	62.	30.	15.	4.	0.	295.	62	DISTILLA	356.	0	0.05	0.04	0.08

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28241 MW 32.00 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 406. PRODUCT POLYESTER HOURS PER YEAR 7900.

POWER TO HEAT RATIO 3.639

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	-75.	451.	220.	109.	32.	-223.	0.	451.	RESIDUAL	451.	0	-0.20	0.24	0.07
6	STIRL	STIRLING-1	HEAT	0.	20.	62.	30.	15.	4.	0.	295.	62.	RESIDUAL	356.	0	0.05	0.04	0.08
6	STIRL	STIRLING-1	POWR	0.	-75.	451.	220.	109.	32.	-223.	0.	451.	COAL	451.	0	-0.20	0.24	0.07
6	STIRL	STIRLING-1	HEAT	0.	20.	62.	30.	15.	4.	0.	295.	62.	COAL	356.	0	0.05	0.04	0.08
7	HEGT85	HELIUM-GT-	POWR	0.	23.	340.	19.	109.	32.	13.	0.	354.	COAL-AFB	354.	11	0.06	0.31	0.08
7	HEGT85	HELIUM-GT-	HEAT	0.	37.	549.	30.	176.	52.	0.	-210.	549.	COAL-AFB	339.	1	0.06	0.32	0.05
8	HEGT60	HELIUM-GT-	POWR	0.	-45.	422.	105.	109.	32.	-89.	0.	422.	COAL-AFB	422.	10	-0.12	0.26	0.07
8	HEGT60	HELIUM-GT-	HEAT	0.	12.	120.	30.	31.	9.	0.	244	120.	COAL-AFB	364.	10	0.03	0.09	0.08
9	HEGT00	HELIUM-GT-	POWR	0.	-244.	620.	297.	109.	32.	-315.	0.	620.	COAL-AFB	620.	10	-0.65	0.18	0.05
9	HEGT00	HELIUM-GT-	HEAT	0.	7.	63.	30.	11.	3.	0.	307.	63.	COAL-AFB	369.	10	0.02	0.03	0.08
10	FCMCCL	FUEL-CL-MO	POWR	0.	17.	359.	170.	109.	32.	-164.	0.	359.	COAL	359.	10	0.05	0.30	0.08
10	FCMCCL	FUEL-CL-MO	HEAT	0.	32.	64.	30.	19.	6.	0.	281.	64.	COAL	344.	10	0.09	0.06	0.09
11	FCSTCL	FUEL-CL-ST	POWR	0.	76.	300.	125.	109.	32.	-111.	0.	300.	COAL	300.	10	0.20	0.36	0.10
11	FCSTCL	FUEL-CL-ST	HEAT	0.	45.	72.	30.	26.	8.	0.	259.	72.	COAL	331.	10	0.12	0.08	0.09
12	IGGTST	INT-GAS-GT	POWR	0.	-37.	413.	184.	109.	32.	-182.	0.	413.	COAL	413.	10	-0.10	0.26	0.07
12	IGGTST	INT-GAS-GT	HEAT	0.	24.	67.	30.	18.	5.	0.	286.	67.	COAL	353.	10	0.06	0.05	0.08
13	GTSOAR	GT-HRSG-10	POWR	0.	-0.	376.	155.	109.	32.	-147.	0.	376.	RESIDUAL	376.	0	-0.00	0.29	0.08
13	GTSOAR	GT-HRSG-10	HEAT	0.	28.	73.	30.	21.	6.	0.	275.	73.	RESIDUAL	348.	10	0.08	0.06	0.09
14	GTAC08	GT-HRSG-08	POWR	0.	-28.	404.	208.	109.	32.	-210.	0.	404.	RESIDUAL	404.	0	-0.07	0.27	0.07
14	GTAC08	GT-HRSG-08	HEAT	0.	26.	58.	30.	16.	5.	0.	292.	58.	RESIDUAL	350.	10	0.07	0.04	0.09
15	GTAC12	GT-HRSG-12	POWR	0.	19.	358.	166.	109.	32.	-160.	0.	358.	RESIDUAL	358.	0	0.05	0.31	0.08
15	GTAC12	GT-HRSG-12	HEAT	0.	32.	65.	30.	20.	6.	0.	279.	65.	RESIDUAL	344.	10	0.09	0.06	0.09
16	GTAC16	GT-HRSG-16	POWR	0.	38.	338.	145.	109.	32.	-135.	0.	338.	RESIDUAL	338.	0	0.10	0.32	0.09
16	GTAC16	GT-HRSG-16	HEAT	0.	36.	70.	30.	23.	7.	0.	270.	70.	RESIDUAL	341.	10	0.10	0.07	0.09
17	GTWC16	GT-HRSG-16	POWR	0.	30.	347.	140.	109.	32.	-130.	0.	347.	RESIDUAL	347.	0	0.08	0.32	0.09
17	GTWC16	GT-HRSG-16	HEAT	0.	34.	74.	30.	23.	7.	0.	268.	74.	RESIDUAL	342.	10	0.09	0.07	0.09

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28241 MW 32.00 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 406. PRODUCT POLYESTER HOURS PER YEAR 7900.

POWER TO HEAT RATIO 3.639

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	0.	75.	301.	98.	109.	32.	-80.	0.	301.	RESIDUAL	301.	0	0.20	0.36	0.10
18	CC1626	GTST-16/26	HEAT	0.	48.	92.	30.	33.	10.	0.	237.	92.	RESIDUAL	329.	10	0.13	0.10	0.09
19	CC1622	GTST-16/22	POWR	0.	70.	307.	109.	109.	32.	-93.	0.	307.	RESIDUAL	307.	0	0.19	0.36	0.10
19	CC1622	GTST-16/22	HEAT	0.	45.	84.	30.	30.	9.	0.	248.	84.	RESIDUAL	332.	10	0.12	0.09	0.09
20	CC1222	GTST-12/22	POWR	0.	70.	306.	110.	109.	32.	-94.	0.	306.	RESIDUAL	306.	0	0.19	0.36	0.10
20	CC1222	GTST-12/22	HEAT	0.	45.	83.	30.	30.	9.	0.	248.	83.	RESIDUAL	332.	10	0.12	0.09	0.09
21	CC0822	GTST-08/22	POWR	0.	47.	329.	140.	109.	32.	-130.	0.	329.	RESIDUAL	329.	0	0.12	0.33	0.09
21	CC0822	GTST-08/22	HEAT	0.	38.	70.	30.	23.	7.	0.	268.	70.	RESIDUAL	339.	10	0.10	0.07	0.09
22	STIG15	STIG-15-16	POWR	0.	59.	287.	4.	109.	32.	31.	0.	317.	RESIDUAL	317.	0	0.16	0.34	0.09
22	STIG15	STIG-15-16	HEAT	0.	475.	2308.	30.	879.	258.	0.	-2406.	2308.	RESIDUAL	-99.	0	0.17	0.38	0.01
23	STIG10	STIG-10-16	POWR	0.	72.	304.	40.	109.	32.	-12.	0.	304.	RESIDUAL	304.	0	0.19	0.36	0.10
23	STIG10	STIG-10-16	HEAT	0.	63.	226.	30.	81.	24.	0.	87.	226.	RESIDUAL	314.	0	0.17	0.26	0.10
24	STIG1S	STIG-1S-16	POWR	0.	51.	326.	69.	109.	32.	-45.	0.	326.	RESIDUAL	326.	0	0.13	0.34	0.09
24	STIG1S	STIG-1S-16	HEAT	0.	42.	142.	30.	48.	14.	0.	192.	142.	RESIDUAL	334.	10	0.11	0.14	0.09
25	DEADV3	DIESEL-ADV	POWR	0.	82.	294.	55.	109.	32.	-30.	0.	294.	RESIDUAL	294.	0	0.22	0.37	0.10
25	DEADV3	DIESEL-ADV	HEAT	0.	61.	160.	30.	59.	17.	0.	156.	160.	RESIDUAL	316.	0	0.16	0.19	0.10
26	DEADV2	DIESEL-ADV	POWR	0.	82.	294.	75.	109.	32.	-53.	0.	294.	RESIDUAL	294.	1	0.22	0.37	0.10
26	DEADV2	DIESEL-ADV	HEAT	0.	54.	118.	30.	44.	13.	0.	204.	118.	RESIDUAL	322.	1	0.14	0.14	0.09
27	DEADV1	DIESEL-ADV	POWR	0.	82.	294.	115.	109.	32.	-100.	0.	294.	RESIDUAL	294.	1	0.22	0.37	0.10
27	DEADV1	DIESEL-ADV	HEAT	0.	48.	77.	30.	28.	8.	0.	252.	77.	RESIDUAL	329.	1	0.13	0.09	0.09
28	DEHTPM	ADV-DIESEL	POWR	0.	25.	351.	150.	109.	32.	-142.	0.	351.	RESIDUAL	351.	0	0.07	0.31	0.09
28	DEHTPM	ADV-DIESEL	HEAT	0.	33.	70.	30.	22.	6.	0.	273.	70.	RESIDUAL	343.	0	0.09	0.06	0.09
29	DESOA3	DIESEL-SOA	POWR	0.	74.	302.	47.	109.	32.	-20.	0.	302.	DISTILLA	302.	0	0.20	0.36	0.10
29	DESOA3	DIESEL-SOA	HEAT	0.	60.	195.	30.	70.	21.	0.	122.	195.	DISTILLA	316.	0	0.16	0.22	0.09
29	DESOA3	DIESEL-SOA	POWR	0.	74.	302.	47.	109.	32.	-20.	0.	302.	RESIDUAL	302.	0	0.20	0.36	0.10
29	DESOA3	DIESEL-SOA	HEAT	0.	60.	195.	30.	70.	21.	0.	122.	195.	RESIDUAL	316.	0	0.16	0.22	0.09

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28241 MW 32.00 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 406 PRODUCT POLYESTER HOURS PER YEAR 7900

POWER TO HEAT RATIO 3.639

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	74.	302.	67.	109.	32.	-43.	0.	302.	DISTILLA	302.	1	0.20	0.36	0.10
30 DESOA2 DIESEL-SOA HEAT	0.	53.	136.	30.	49.	14.	0.	187.	136.	DISTILLA	324.	1	0.14	0.15	0.09
30 DESOA2 DIESEL-SOA POWR	0.	74.	302.	67.	109.	32.	-43.	0.	302.	RESIDUAL	302.	1	0.20	0.36	0.10
30 DESOA2 DIESEL-SOA HEAT	0.	53.	136.	30.	49.	14.	0.	187.	136.	RESIDUAL	324.	1	0.14	0.15	0.09
31 DESOA1 DIESEL-SOA POWR	0.	74.	302.	121.	109.	32.	-107.	0.	302.	DISTILLA	302.	1	0.20	0.36	0.10
31 DESOA1 DIESEL-SOA HEAT	0.	45.	75.	30.	27.	8.	0.	257.	75.	DISTILLA	332.	1	0.12	0.08	0.09
31 DESOA1 DIESEL-SOA POWR	0.	74.	302.	121.	109.	32.	-107.	0.	302.	RESIDUAL	302.	1	0.20	0.36	0.10
31 DESOA1 DIESEL-SOA HEAT	0.	45.	75.	30.	27.	8.	0.	257.	75.	RESIDUAL	332.	1	0.12	0.08	0.09
32 GTSOAD GT-HRSG-10 POWR	0.	3.	374.	171.	109.	32.	-166.	0.	374.	DISTILLA	374.	0	0.01	0.29	0.08
32 GTSOAD GT-HRSG-10 HEAT	0.	30.	66.	30.	19.	6.	0.	281.	66.	DISTILLA	347.	10	0.08	0.06	0.09
33 GTRA08 GT-85RE-08 POWR	0.	71.	306.	97.	109.	32.	-79.	0.	306.	DISTILLA	306.	0	0.19	0.36	0.10
33 GTRA08 GT-85RE-08 HEAT	0.	46.	94.	30.	34.	10.	0.	236.	94.	DISTILLA	330.	10	0.12	0.10	0.09
34 GTRA12 GT-85RE-12 POWR	0.	72.	305.	101.	109.	32.	-84.	0.	305.	DISTILLA	305.	0	0.19	0.36	0.10
34 GTRA12 GT-85RE-12 HEAT	0.	46.	91.	30.	32.	10.	0.	240.	91.	DISTILLA	330.	10	0.12	0.10	0.09
35 GTRA16 GT-85RE-16 POWR	0.	64.	313.	109.	109.	32.	-93.	0.	313.	DISTILLA	313.	0	0.17	0.35	0.10
35 GTRA16 GT-85RE-16 HEAT	0.	43.	86.	30.	30.	9.	0.	248.	86.	DISTILLA	333.	10	0.11	0.09	0.09
36 GTR208 GT-60RE-08 POWR	0.	35.	341.	134.	109.	32.	-122.	0.	341.	DISTILLA	341.	0	0.09	0.32	0.09
36 GTR208 GT-60RE-08 HEAT	0.	35.	77.	30.	24.	7.	0.	265.	77.	DISTILLA	341.	10	0.09	0.07	0.09
37 GTR212 GT-60RE-12 POWR	0.	46.	331.	125.	109.	32.	-111.	0.	331.	DISTILLA	331.	0	0.12	0.33	0.09
37 GTR212 GT-60RE-12 HEAT	0.	38.	80.	30.	26.	8.	0.	259.	80.	DISTILLA	339.	10	0.10	0.08	0.09
38 GTR216 GT-60RE-16 POWR	0.	53.	324.	121.	109.	32.	-108.	0.	324.	DISTILLA	324.	0	0.14	0.34	0.09
38 GTR216 GT-60RE-16 HEAT	0.	40.	80.	30.	27.	8.	0.	257.	80.	DISTILLA	337.	10	0.11	0.08	0.09
39 GTRW08 GT-85RE-08 POWR	0.	65.	311.	82.	109.	32.	-61.	0.	311.	DISTILLA	311.	0	0.17	0.35	0.10
39 GTRW08 GT-85RE-08 HEAT	0.	46.	114.	30.	40.	12.	0.	217.	114.	DISTILLA	330.	10	0.12	0.12	0.09
40 GTRW12 GT-85RE-12 POWR	0.	77.	300.	8[illegible].	109.	[illegible]	-61.	0.	300.	DISTILLA	300.	0	0.20	0.38	0.10
40 GTRW12 GT-85RE-12 HEAT	0.	50.	110.	[illegible]	40.	12.	0.	216.	110.	DISTILLA	326.	10	0.13	0.12	0.09

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28241 MW 32.00 PROCESS MILLIONS BTU/HR 30.0 PROCESS TEMP(F) 406. PRODUCT POLYESTER HOURS PER YEAR 7900.

POWER TO HEAT RATIO 3.639

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	71.	306.	89.	109.	32.	-70.	0.	306.	DISTILLA	306.	0	0.19	0.36	0.10
41 GTRW16 GT-85RE-16 HEAT	0.	47.	103.	30.	37.	11.	0.	226.	103.	DISTILLA	329.	10	0.13	0.11	0.09
42 GTR308 GT-60RE-08 POWR	0.	24.	352.	108.	109.	32.	-92.	0.	352.	DISTILLA	352.	0	0.06	0.31	0.09
42 GTR308 GT-60RE-08 HEAT	0.	32.	98.	30.	30.	9.	0.	247.	98	DISTILLA	344.	10	0.09	0.09	0.09
43 GTR312 GT-60RE-12 POWR	0.	57.	319.	104.	109.	32.	-87.	0.	319.	DISTILLA	319.	0	0.15	0.34	0.09
43 GTR312 GT-60RE-12 HEAT	0.	42.	92.	30.	31.	9.	0.	243.	92.	DISTILLA	335.	10	0.11	0.09	0.09
44 GTR316 GT-60RE-16 POWR	0.	54.	322.	106.	109.	32.	-89.	0.	322.	DISTILLA	322.	0	0.14	0.34	0.09
44 GTR316 GT-60RE-16 HEAT	0.	41.	91.	30.	31.	9.	0.	244.	91.	DISTILLA	336.	10	0.11	0.09	0.09
45 FCPADS FUEL-CL-PH POWR	0.	89.	287.	49.	109.	32.	-22.	0.	287.	DISTILLA	287.	0	0.24	0.38	0.10
45 FCPADS FUEL-CL-PH HEAT	0.	68.	176.	30.	67.	20.	0.	132.	176.	DISTILLA	308.	0	0.18	0.22	0.10
46 FCMCDS FUEL-CL-MO POWR	0.	111.	265.	62.	109.	32.	-37.	0.	265.	DISTILLA	265.	0	0.30	0.41	0.11
46 FCMCDS FUEL-CL-MO HEAT	0.	72.	129.	30.	53.	16.	0.	175	129.	DISTILLA	304.	0	0.19	0.17	0.10

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28242 MW 11.00 PROCESS MILLIONS BTU/HR 23.0 PROCESS TEMP(F) 274. PRODUCT NYLON-66-FIB HOURS PER YEAR 8760.

POWER TO HEAT RATIO 1.632

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	27.	117.	27.	RESIDUAL	144.	0	0.	0.26	0.16
1 STM141 STM-TURB-1 POWR	0.	-61.	205.	137.	38.	11.	-134.	0.	205.	RESIDUAL	205.	0	-0.42	0.18	0.11
1 STM141 STM-TURB-1 HEAT	0.	12.	34.	23.	6.	2.	0.	98.	34.	RESIDUAL	132.	10	0.09	0.05	0.17
1 STM141 STM-TURB-1 POWR	0.	-61.	205.	137.	38.	11.	-134.	0.	205.	COAL-FGD	205.	0	-0.42	0.18	0.11
1 STM141 STM-TURB-1 HEAT	0.	12.	34.	23.	6.	2.	0.	98.	34.	COAL-FGD	132.	10	0.09	0.05	0.17
1 STM141 STM-TURB-1 POWR	0.	-61.	205.	137.	38.	11.	-134.	0.	205.	COAL-AFB	205.	0	-0.42	0.18	0.11
1 STM141 STM-TURB-1 HEAT	0.	12.	34.	23.	6.	2.	0.	98.	34.	COAL-AFB	132.	10	0.09	0.05	0.17
2 STM088 STM-TURB-8 POWR	0.	-107.	252.	176.	38.	11.	-180.	0.	252.	RESIDUAL	252.	0	-0.74	0.15	0.09
2 STM088 STM-TURB-8 HEAT	0.	10.	33.	23.	5.	1.	0.	102.	33.	RESIDUAL	135.	10	0.07	0.04	0.17
2 STM088 STM-TURB-8 POWR	0.	-107.	252.	176.	38.	11.	-180.	0.	252.	COAL-FGD	252.	0	-0.74	0.15	0.09
2 STM088 STM-TURB-8 HEAT	0.	10.	33.	23.	5.	1.	0.	102.	33.	COAL-FGD	135.	10	0.07	0.04	0.17
2 STM088 STM-TURB-8 POWR	0.	-107.	252.	176.	38.	11.	-180.	0.	252.	COAL-AFB	252.	0	-0.74	0.15	0.09
2 STM088 STM-TURB-8 HEAT	0.	10.	33.	23.	5.	1.	0.	102.	33.	COAL-AFB	135.	10	0.07	0.04	0.17
3 PFBSTM PFB-STMTB- POWR	0.	-9.	153.	92.	38.	11.	-81.	0.	153.	COAL-PFB	153.	10	-0.06	0.24	0.15
3 PFBSTM PFB-STMTB- HEAT	0.	18.	38.	23.	9.	3.	0.	88.	38	COAL-PFB	126.	10	0.13	0.07	0.18
4 TISTMT TI-STMTB-1 POWR	0.	16.	129.	71.	38.	11.	-56.	0.	129.	RESIDUAL	129.	10	0.11	0.29	0.18
4 TISTMT TI-STMTB-1 HEAT	0.	23.	42.	23.	12.	4.	0.	79.	42.	RESIDUAL	121.	10	0.16	0.10	0.19
4 TISTMT TI-STMTB-1 POWR	0.	16.	129.	71.	38.	11.	-56.	0.	129.	COAL	129.	10	0.11	0.29	0.18
4 TISTMT TI-STMTB-1 HEAT	0.	23.	42.	23.	12.	4.	0.	79.	42.	COAL	121.	10	0.16	0.10	0.19
5 TIHRSG THERMIONIC POWR	0.	-122.	267.	179.	38.	11.	-184.	0.	267.	RESIDUAL	267.	0	-0.85	0.14	0.09
5 TIHRSG THERMIONIC HEAT	0.	8.	34.	23.	5.	1.	0.	102.	34.	RESIDUAL	136.	10	0.05	0.04	0.17
5 TIHRSG THERMIONIC POWR	0.	-122.	267.	179.	38.	11.	-184.	0.	267.	COAL	267.	0	-0.85	0.14	0.09
5 TIHRSG THERMIONIC HEAT	.	8.	34.	23.	5.	1.	0.	102.	34.	COAL	136.	10	0.05	0.04	0.17
6 STIRL STIRLING-1 POWR	0.	6.	138.	63.	38.	11.	-47.	0.	138.	DISTILLA	138.	0	0.04	0.27	0.17
6 STIRL STIRLING-1 HEAT	0.	19.	50.	23.	14.	4.	0.	75.	50.	DISTILLA	125.	0	0.14	0.11	0.18

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28242 MW 11.00 PROCESS MILLIONS BTU/HR 23.0 PROCESS TEMP(F) 274. PRODUCT NYLON-66-FIB HOURS PER YEAR 8760.

POWER TO HEAT RATIO 1.632

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	6.	138.	63.	38.	11.	-47.	0.	138.	RESIDUAL	138.	0	0.04	0.27	0.17
6 STIRL	STIRLING-1	HEAT	0.	19.	50.	23.	14.	4.	0.	75.	50.	RESIDUAL	125.	0	0.14	0.11	0.18
6 STIRL	STIRLING-1	POWR	0.	6.	138.	63.	38.	11.	-47.	0.	138.	COAL	138.	0	0.04	0.27	0.17
6 STIRL	STIRLING-1	HEAT	0.	19.	50.	23.	14.	4.	0.	75.	50.	COAL	125.	0	0.14	0.11	0.18
7 HEGT85	HELIUM-GT-	POWR	0.	27.	117.	29.	38.	11.	-6.	0.	117.	COAL-AFB	117.	10	0.19	0.32	0.20
7 HEGT85	HELIUM-GT-	HEAT	0.	27.	94.	23.	30.	9.	0.	23.	94.	COAL-AFB	117.	10	0.19	0.26	0.20
8 HEGT60	HELIUM-GT-	POWR	0	-1.	145.	53.	38.	11.	-35.	0.	145.	COAL-AFB	145.	10	-0.00	0.26	0.16
8 HEGT60	HELIUM-GT-	HEAT	0.	15.	63.	23.	16.	5.	0.	66.	63.	COAL-AFB	129.	10	0.10	0.13	0.18
9 HEGT00	HELIUM-GT-	POWR	0.	-69.	213.	109.	38.	11.	-101.	0.	213.	COAL-AFB	213.	10	-0.48	0.18	0.11
9 HEGT00	HELIUM-GT-	HEAT	0.	7.	45.	23.	8.	2.	0.	93.	45.	COAL-AFB	138.	10	0.05	0.06	0.17
10 FCMCCL	FUEL-CL-MO	POWR	0.	21.	123.	59.	38.	11.	-42.	0.	123.	COAL	123.	10	0.14	0.30	0.19
10 FCMCCL	FUEL-CL-MO	HEAT	0.	25.	48.	23.	15.	4.	0.	71.	48.	COAL	120.	10	0.17	0.12	0.19
11 FCSTCL	FUEL-CL-ST	POWR	0.	52.	93.	35.	38.	11.	-14.	0.	93.	COAL	93.	10	0.36	0.41	0.25
11 FCSTCL	FUEL-CL-ST	HEAT	0.	44.	62.	23.	25.	7.	0.	39.	62.	COAL	101.	10	0.30	0.25	0.23
12 IGGTST	INT-GAS-GT	POWR	0.	23.	121.	49.	38.	11.	-30.	0.	121.	COAL	121.	10	0.16	0.31	0.19
12 IGGTST	INT-GAS-GT	HEAT	0.	25.	57.	23.	18.	5.	0.	62.	57.	COAL	119.	10	0.17	0.15	0.19
13 GTSOAR	GT-HRSG-10	POWR	0.	15.	129.	58.	38.	11.	-41.	0.	129.	RESIDUAL	129.	0	0.10	0.29	0.18
13 GTSOAR	GT-HRSG-10	HEAT	0.	22.	51.	23.	15.	4.	0.	71.	51.	RESIDUAL	122.	10	0.15	0.12	0.19
14 GTAC08	GT-HRSG-08	POWR	0.	5.	139.	71.	38.	11.	-56.	0.	139.	RESIDUAL	139.	10	0.04	0.27	0.17
14 GTAC08	GT-HRSG-08	HEAT	0.	20.	45.	23.	12.	4.	0.	79.	45.	RESIDUAL	124.	10	0.14	0.10	0.18
15 GTAC12	GT-HRSG-12	POWR	0.	21.	123.	58.	38.	11.	-41.	0.	123.	RESIDUAL	123.	10	0.15	0.31	0.19
15 GTAC12	GT-HRSG-12	HEAT	0.	25.	49	23.	15.	4.	0.	71.	49.	RESIDUAL	120.	10	0.17	0.12	0.19
16 GTAC16	GT-HRSG-16	POWR	0.	28.	116.	52.	38.	11.	-34.	0.	116.	RESIDUAL	116.	10	0.20	0.32	0.20
16 GTAC16	GT-HRSG-16	HEAT	0.	28.	52.	23.	17.	5.	0.	65.	52.	RESIDUAL	117.	10	0.19	0.14	0.20
17 GTWC16	GT-HRSG-16	POWR	0.	25.	119.	48.	38.	11.	-30.	0.	119.	RESIDUAL	119	10	0.17	0.32	0.19
17 GTWC16	GT-HRSG-16	HEAT	0.	26.	57.	23.	18.	5.	0.	61.	57.	RESIDUAL	118.	10	0.18	0.15	0.19

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28242 MW 11.00 PROCESS MILLIONS BTU/HR 23.0 PROCESS TEMP(F) 274. PRODUCT NYLON-66-FIB HOURS PER YEAR 8760.

POWER TO HEAT RATIO 1.632

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	49.	95.	28.	38.	11.	-6.	0.	95.	RESIDUAL	95.	10	0.34	0.40	0.24
18 CC1626 GTST-16/26 HEAT	0.	46.	79.	23.	31.	9.	0.	20.	79.	RESIDUAL	99.	10	0.32	0.32	0.23
19 CC1622 GTST-16/22 POWR	0.	48.	96.	31.	38.	11.	-9.	0.	96.	RESIDUAL	96.	10	0.34	0.39	0.24
19 CC1622 GTST-16/22 HEAT	0.	43.	72.	23.	28.	8.	0.	30.	72.	RESIDUAL	101.	10	0.30	0.28	0.23
20 CC1222 GTST-12/22 POWR	0.	49.	95.	31.	38.	11.	-9.	0.	95.	RESIDUAL	95.	10	0.34	0.39	0.24
20 CC1222 GTST-12/22 HEAT	0.	43.	71.	23.	28.	8.	0.	30.	71.	RESIDUAL	101.	10	0.30	0.28	0.23
21 CC0822 GTST-08/22 POWR	0.	44.	100.	38.	38.	11.	-18.	0.	100.	RESIDUAL	100.	10	0.31	0.37	0.23
21 CC0822 GTST-08/22 HEAT	0.	37.	60.	23.	23.	7.	0.	47.	60.	RESIDUAL	107.	10	0.26	0.21	0.21
22 STIG15 STIG-15-16 POWR	0.	20.	99.	1.	38.	11.	26.	0.	124.	RESIDUAL	124.	10	0.14	0.30	0.19
22 STIG15 STIG-15-16 HEAT	0.	364.	1769.	23.	674.	198.	0.	-1989.	1769.	RESIDUAL	-220.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	29.	105.	14.	38.	11.	11.	0.	115.	RESIDUAL	115.	10	0.20	0.33	0.20
23 STIG10 STIG-10-16 HEAT	0.	48.	174.	23.	62.	18.	0.	-78.	174.	RESIDUAL	96.	10	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	32.	112.	24.	38.	11.	-1.	0.	112.	RESIDUAL	112.	10	0.22	0.34	0.21
24 STIG1S STIG-1S-16 HEAT	0.	32.	109.	23.	37.	11.	0.	3.	109.	RESIDUAL	112.	10	0.22	0.33	0.21
25 DEADV3 DIESEL-ADV POWR	0.	43.	101.	25.	38.	11.	-2.	0.	101.	RESIDUAL	101.	0	0.30	0.37	0.23
25 DEADV3 DIESEL-ADV HEAT	0.	42.	94.	23.	35.	10.	0.	8.	94.	RESIDUAL	102.	0	0.29	0.34	0.22
26 DEADV2 DIESEL-ADV POWR	0.	43.	101.	26.	38.	11.	-3.	0.	101.	RESIDUAL	101.	1	0.30	0.37	0.23
26 DEADV2 DIESEL-ADV HEAT	0.	41.	91.	23.	34.	10.	0.	12.	91.	RESIDUAL	103.	1	0.29	0.33	0.22
27 DEADV1 DIESEL-ADV POWR	0.	43.	101.	40.	38.	11.	-19.	0.	101.	RESIDUAL	101.	1	0.30	0.37	0.23
27 DEADV1 DIESEL-ADV HEAT	0.	36.	59.	23.	22.	6.	0.	49.	59.	RESIDUAL	108.	1	0.25	0.20	0.21
28 DEHTPM ADV-DIESEL POWR	0.	40.	105.	46.	38.	11.	-27.	0.	105.	RESIDUAL	105.	0	0.27	0.36	0.22
28 DEHTPM ADV-DIESEL HEAT	0.	33.	53.	23.	19.	6.	0.	58.	53.	RESIDUAL	111.	0	0.23	0.17	0.21
29 DESOA3 DIESEL-SOA POWR	0.	39.	104.	22.	38.	11.	1.	0	105.	DISTILLA	105.	0	0.27	0.36	0.22
29 DESOA3 DIESEL-SOA HEAT	0.	41.	110.	23.	40.	12.	0.	-6.	110.	DISTILLA	103.	0	0.27	0.36	0.21
29 DESOA3 DIESEL-SOA POWR	0.	39.	104.	22.	38.	11.	1.	0.	105.	RESIDUAL	105.	0	0.27	0.36	0.22
29 DESOA3 DIESEL-SOA HEAT	0.	41.	110.	23.	40.	12.	0.	-6.	110.	RESIDUAL	103.	0	0.27	0.36	0.21

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28242 MW 11.00 PROCESS MILLIONS BTU/HR 23.0 PROCESS TEMP(F) 274. PRODUCT NYLON-66-FIB HOURS PER YEAR 8760.

POWER TO HEAT RATIO 1.632

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	40.	104.	23.	38.	11.	0.	0.	104.	DISTILLA	104.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA HEAT	0.	40.	105.	23.	38.	11.	0.	-1.	105.	DISTILLA	104.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	40.	104.	23.	38.	11.	0.	0.	104.	RESIDUAL	104.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA HEAT	0.	40.	105.	23.	38.	11.	0.	-1.	105.	RESIDUAL	104.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	40.	104.	42.	38.	11.	-22.	0.	104.	DISTILLA	104.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA HEAT	0.	34.	57.	23.	21.	6.	0.	53.	57.	DISTILLA	110.	1	0.24	0.19	0.21
31 DESOA1 DIESEL-SOA POWR	0.	40.	104.	42.	38.	11.	-22.	0.	104.	RESIDUAL	104.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA HEAT	0.	34.	57.	23.	21.	6.	0.	53.	57.	RESIDUAL	110.	1	0.24	0.19	0.21
32 GTSOAD GT-HRSG-10 POWR	0.	16.	129.	61.	38.	11.	-44.	0.	129.	DISTILLA	129.	10	0.11	0.29	0.18
32 GTSOAD GT-HRSG-10 HEAT	0.	23.	49.	23.	14.	4.	0.	73.	49.	DISTILLA	122.	10	0.16	0.12	0.19
33 GTRA08 GT-85RE-08 POWR	0.	39.	105.	39.	38.	11.	-19.	0.	105.	DISTILLA	105.	10	0.27	0.36	0.22
33 GTRA08 GT-85RE-08 HEAT	0.	34.	62.	23.	22.	7.	0.	48.	62.	DISTILLA	110.	10	0.24	0.20	0.21
34 GTRA12 GT-85RE-12 POWR	0.	40.	105.	39.	38.	11.	-19.	0.	105.	DISTILLA	105.	10	0.27	0.36	0.22
34 GTRA12 GT-85RE-12 HEAT	0.	34.	61.	23.	22.	6.	0.	49.	61.	DISTILLA	110.	10	0.24	0.20	0.21
35 GTRA16 GT-85RE-16 POWR	0.	37.	108.	42.	38.	11.	-22.	0.	108.	DISTILLA	108.	10	0.25	0.35	0.21
35 GTRA16 GT-85RE-16 HEAT	0.	32.	59.	23.	21.	6.	0.	53.	59.	DISTILLA	112.	10	0.22	0.18	0.21
36 GTR208 GT-60RE-08 POWR	0.	27.	117.	50.	38.	11.	-31.	0.	117.	DISTILLA	117.	10	0.19	0.32	0.20
36 GTR208 GT-60RE-08 HEAT	0.	27.	54.	23.	17.	5.	0.	63.	54.	DISTILLA	117.	10	0.19	0.15	0.20
37 GTR212 GT-60RE-12 POWR	0.	31.	114.	46.	38.	11.	-27.	0.	114.	DISTILLA	114.	10	0.21	0.33	0.20
37 GTR212 GT-60RE-12 HEAT	0.	29.	57.	23.	19.	5.	0.	59.	57.	DISTILLA	116.	10	0.20	0.16	0.20
38 GTR216 GT-60RE-16 POWR	0.	33.	111.	45.	38.	11.	-26.	0.	111.	DISTILLA	111.	10	0.23	0.34	0.21
38 GTR216 GT-60RE-16 HEAT	0.	30.	57.	23.	19.	6.	0.	58.	57.	DISTILLA	114.	10	0.21	0.17	0.20
39 GTRW08 GT-85RE-08 POWR	0.	37.	107.	32.	38.	11.	-11.	0.	107.	DISTILLA	107.	10	0.26	0.35	0.22
39 GTRW08 GT-85RE-08 HEAT	0.	34.	76.	23.	27.	8.	0.	34.	76.	DISTILLA	110.	10	0.24	0.24	0.21
40 GTRW12 GT-85RE-12 POWR	0.	41.	103.	31.	38.	11.	-10.	0.	103.	DISTILLA	103.	10	0.29	0.36	0.22
40 GTRW12 GT-85RE-12 HEAT	0.	37.	76.	23.	27.	8.	0.	31.	76.	DISTILLA	107.	10	0.26	0.26	0.22

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28242 MW 11.00 PROCESS MILLIONS BTU/HR 23.0 PROCESS TEMP(F) 274. PRODUCT NYLON-66-FIB HOURS PER YEAR 8760.

POWER TO HEAT RATIO 1.632

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	GTRW16	GT-85RE-16	POWR	0.	39.	105.	33.	38.	11.	-12.	0.	105.	DISTILLA	105.	10	0.27	0.36	0.22
41	GTRW16	GT-85RE-16	HEAT	0.	35.	72.	23.	26.	8.	0.	37.	72.	DISTILLA	109.	10	0.25	0.24	0.21
42	GTR308	GT-60RE-08	POWR	0.	23.	121.	43.	38.	11.	-23.	0.	121.	DISTILLA	121.	10	0.16	0.31	0.19
42	GTR308	GT-60RE-08	HEAT	0.	25.	65.	23.	20.	6.	0.	54.	65.	DISTILLA	119.	10	0.17	0.17	0.19
43	GTR312	GT-60RE-12	POWR	0.	35.	110.	38.	38.	11.	-17.	0.	110.	DISTILLA	110.	10	0.24	0.34	0.21
43	GTR312	GT-60RE-12	HEAT	0.	32.	67.	23.	23.	7.	0.	46.	67.	DISTILLA	113.	10	0.22	0.20	0.20
44	GTR316	GT-60RE-16	POWR	0.	34.	111.	38.	38.	11.	-18.	0.	111.	DISTILLA	111.	10	0.23	0.34	0.21
44	GTR316	GT-60RE-16	HEAT	0.	31.	67.	23.	23.	7.	0.	47.	67.	DISTILLA	113.	10	0.21	0.20	0.20
45	FCPADS	FUEL-CL-PH	POWR	0.	38.	99.	17.	38.	11.	7.	0.	106.	DISTILLA	106.	0	0.27	0.35	0.22
45	FCPADS	FUEL-CL-PH	HEAT	0.	52.	135.	23.	51.	15.	0.	-43.	135.	DISTILLA	92.	0	0.28	0.38	0.17
46	FCMCDS	FUEL-CL-MO	POWR	0.	51.	91.	21.	38.	11.	2.	0.	93.	DISTILLA	93.	0	0.[illegible]5	0.40	0.25
46	FCMCDS	FUEL-CL-MO	HEAT	0.	55.	99.	23.	41.	12.	0.	-10.	99.	DISTILLA	89.	[illegible]	[illegible]	0.41	0.23

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28651 MW 4.40 PROCESS MILLIONS BTU/HR 510.0 PROCESS TEMP(F) 320. PRODUCT STYRENE-MONO HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.029

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6* 235. HOT WATER BTU*10**6* 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		235.	0.	0.	0.	0.	0.	600.	47.	600.	COAL-FGD	647.	0	0.	0.02	0.79
1	STM141	STM-TURB-1	POWR	235.	29.	90.	62.	15.	4.	527.	0.	618.	RESIDUAL	618.	10	0.07	0.02	0.83
1	STM141	STM-TURB-1	HEAT	235.	242.	746.	510.	124.	36.	0.	-341.	746.	RESIDUAL	405.	0	0.32	0.17	0.68
1	STM141	STM-TURB-1	POWR	235.	29.	90.	62.	15.	4.	527.	0.	618.	COAL-FGD	618.	10	0.07	0.02	0.83
1	STM141	STM-TURB-1	HEAT	235.	242.	746.	510.	124.	36.	0.	-341.	746.	COAL-FGD	405.	0	0.32	0.17	0.68
1	STM141	STM-TURB-1	POWR	235.	29.	90.	62.	15.	4.	527.	0.	618.	COAL-AFB	618.	10	0.07	0.02	0.83
1	STM141	STM-TURB-1	HEAT	235.	242.	746.	510.	124.	36.	0.	-341.	746.	COAL-AFB	405.	0	0.32	0.17	0.68
2	STM088	STM-TURB-8	POWR	235.	29.	113.	81.	15.	4.	504.	0.	618.	RESIDUAL	618.	10	0.07	0.02	0.83
2	STM088	STM-TURB-8	HEAT	235.	183.	711.	510.	94.	28.	0.	-247.	711.	RESIDUAL	464.	0	0.28	0.13	0.72
2	STM088	STM-TURB-8	POWR	235.	29.	113.	81.	15.	4.	504.	0.	618	COAL-FGD	618.	10	0.07	0.02	0.83
2	STM088	STM-TURB-8	HEAT	235.	183.	711.	510.	94.	28.	0.	-247.	711.	COAL-FGD	464.	0	0.28	0.13	0.72
2	STM088	STM-TURB-8	POWR	235.	29.	113.	81.	15.	4.	504.	0.	618.	COAL-AFB	618.	10	0.07	0.02	0.83
2	STM088	STM-TURB-8	HEAT	235.	183.	711.	510.	94.	28.	0.	-247.	711.	COAL-AFB	464.	0	0.28	0.13	0.72
3	PFBSTM	PFB-STMTB-	POWR	235.	29.	65.	40.	15.	4.	553.	0.	618.	COAL-PFB	618.	10	0.07	0.02	0.83
3	PFBSTM	PFB-STMTB-	HEAT	235.	367.	831.	510.	191.	56.	0.	-551.	831.	COAL-PFB	280.	0	0.38	0.23	0.61
4	TISTMT	TI-STMTB-1	POWR	235.	29.	54.	30.	15.	4.	564.	0.	618.	RESIDUAL	618.	10	0.07	0.02	0.83
4	TISTMT	TI-STMTB-1	HEAT	235.	293.	549.	310.	153.	45.	235.	-430.	784.	RESIDUAL	354.	0	0.35	0.19	0.65
4	TISTMT	TI-STMTB-1	POWR	235.	29.	54.	30.	15.	4.	564.	0.	618.	COAL	618.	10	0.07	0.02	0.83
4	TISTMT	TI-STMTB-1	HEAT	235.	482.	903.	510.	251.	74.	0.	-738.	903.	COAL	165.	0	0.42	0.28	0.56
5	TIHRSG	THERMIONIC	POWR	235.	23.	107.	70.	15.	4.	517.	0.	624.	RESIDUAL	624.	0	0.06	0.02	0.82
5	TIHRSG	THERMIONIC	HEAT	235.	102.	470.	310.	66.	19.	235.	-160.	705.	RESIDUAL	545.	0	0.18	0.09	0.72
5	TIHRSG	THERMIONIC	POWR	235.	23.	107.	70.	15.	4.	517	0.	624.	COAL	624.	0	0.06	0.02	0.82
5	TIHRSG	THERMIONIC	HEAT	235.	167.	772.	510.	109.	32.	0.	-293.	772.	COAL	480.	0	0.24	0.14	0.66
6	STIRL	STIRLING-1	POWR	235.	21.	57.	27.	15.	4.	569.	0.	626.	DISTILLA	626.	0	0.05	0.02	0.81
6	STIRL	STIRLING-1	HEAT	235.	245.	664.	310.	174.	51.	235.	-498.	900.	DISTILLA	402.	0	0.27	0.19	0.57

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28651 MW 4.40 PROCESS MILLIONS BTU/HR 510.0 PROCESS TEMP(F) 320. PRODUCT STYRENE-MONO HOURS PER YEAR 7900

POWER TO HEAT RATIO 0.029

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 235. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	235.	21.	57.	27.	15.	4.	569.	0.	626.	RESIDUAL	626.	0	0.05	0.02	0.81
6 STIRL STIRLING-1 HEAT	235.	245.	664.	310.	17[illegible]	51.	235.	-498.	900.	RESIDUAL	402.	0	0.27	0.19	0.57
6 STIRL STIRLING-1 POWR	235.	21.	57.	27.	15.	4.	569.	0.	626.	COAL	626.	0	0.05	0.02	0.81
6 STIRL STIRLING-1 HEAT	235.	403.	1093.	510.	287.	84.	0.	-850.	1093.	COAL	244.	0	0.32	0.26	0.47
7 HEGT85 HELIUM-GT- POWR	235.	10.	47.	9.	15.	4.	590.	0.	637.	COAL-AFB	637.	10	0.03	0.02	0.80
7 HEGT85 HELIUM-GT- HEAT	235.	609.	2762.	510.	887.	260.	0.	-2724.	2762.	COAL-AFB	38.	0	0.19	0.32	0.18
8 HEGT60 HELIUM-GT- POWR	235.	12.	58.	19.	15.	4.	577.	0.	635.	COAL-AFB	635.	10	0.03	0.02	0.80
8 HEGT60 HELIUM-GT- HEAT	235.	306.	1540.	510.	399.	117.	0.	-1200.	1540.	COAL-AFB	341.	0	0.19	0.26	0.33
9 HEGT00 HELIUM-GT- POWR	235.	12.	85.	43.	15.	4.	550.	0.	635.	COAL-AFB	635.	10	0.03	0.02	0.80
9 HEGT00 HELIUM-GT- HEAT	235.	141.	1021.	510.	180.	53.	0.	-514.	1021.	COAL-AFB	506.	0	0.15	0.18	0.50
10 FCMCCL FUEL-CL-MO POWR	0.	25.	49.	23.	15.	4.	572.	0.	622.	COAL	622.	10	-0.51	0.02	0.82
10 FCMCCL FUEL-CL-MO HEAT	0.	546.	1075.	510.	327.	96	0.	-975.	1075.	COAL	101.	10	0.22	0.30	0.47
11 FCSTCL FUEL-CL-ST POWR	0.	26.	38.	14.	15.	4.	583.	0.	621.	COAL	621.	10	-0.51	0.02	0.62
11 FCSTCL FUEL-CL-ST HEAT	0.	918.	1332.	510.	528.	155.	0.	-1604.	1332.	COAL	-271.	0	0.34	0.40	0.38
12 IGGTST INT-GAS-GT POWR	0.	21.	50.	21.	15.	4.	576.	0.	626.	COAL	626.	10	-0.5[illegible]	0.02	0.81
12 IGGTST INT-GAS-GT HEAT	0.	521.	1242.	510.	372.	109.	0.	-1116.	1242.	COAL	126.	0	0.19	0.30	0.41
13 GTSOAR GT-HRSG-10 POWR	235.	22.	52.	23.	15.	4.	573.	0.	625.	RESIDUAL	625.	10	0.05	0.02	0.82
13 GTSOAR GT-HRSG-10 HEAT	235.	298.	709.	310.	206.	[illegible]	235.	-596.	944.	RESIDUAL	349.	0	0.30	0.22	0.54
14 GTAC08 GT-HRSG-08 POWR	235.	25.	56.	29.	15.	4.	566.	0.	622.	RESIDUAL	622.	10	0.06	0.02	0.82
14 GTAC08 GT-HRSG-08 HEAT	235.	270.	605.	310.	163	48.	235.	-463.	840.	RESIDUAL	377.	0	0.31	0.19	0.6[illegible]
15 GTAC12 GT-HRSG-12 POWR	235.	25.	49.	23.	15.	4.	573.	0.	622.	RESIDUAL	622.	10	0.06	0.02	0.82
15 GTAC12 GT-HRSG-12 HEAT	235.	334.	664.	310.	203.	59.	235.	-586.	900.	RESIDUAL	313.	0	0.33	0.23	0.57
16 GTAC16 GT-HRSG-16 POWR	235.	24.	46.	20.	15.	4.	576.	0.	623.	RESIDUAL	623.	10	0.06	0.02	0.82
16 GTAC16 GT-HRSG-16 HEAT	235.	371.	707.	310.	228.	67.	235.	-667.	942.	RESIDUAL	276.	0	0.34	0.[illegible]	0.54
17 GTWC16 GT-HRSG-16 POWR	235.	22.	48.	19.	15.	4.	577.	0.	625.	RESIDUAL	625.	10	0.05	0.02	0.82
17 GTWC16 GT-HRSG-16 HEAT	235.	353.	767.	310.	242.	71.	235.	-708.	1002.	RESIDUAL	294.	0	0.32	0.24	0.51

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28651 MW 4.40 PROCESS MILLIONS BTU/HR 3[illegible]0.0 PROCESS TEMP(F) 320. PRODUCT STYRENE-MONO HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.029

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 235. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	235.	22.	39.	12.	15.	4.	586.	0.	625.	RESIDUAL	625.	10	0.05	0.02	0.82
18 CC1626 GTST-16/26 HEAT	235.	585.	1035.	310.	402.	118.	235.	-1209.	1271.	RESIDUAL	61.	0	0.36	0.32	0.40
19 CC1622 GTST-16/22 POWR	235.	23.	39.	13.	15.	4.	585.	0.	624.	RESIDUAL	624.	10	0.06	0.02	0.82
19 CC1622 GTST-16/22 HEAT	235.	553.	944.	310.	362.	106.	235.	-1085.	1179.	RESIDUAL	94.	0	0.37	0.31	0.43
20 CC1222 GTST-12/22 POWR	235.	23.	39.	13.	15.	4.	585.	0.	624.	RESIDUAL	624.	10	0.06	0.02	0.82
20 CC1222 GTST-12/22 HEAT	235.	556.	936.	310.	361.	106.	235.	-1081.	1172.	RESIDUAL	91.	0	0.37	0.31	0.44
21 CC0822 GTST-08/22 POWR	235.	25.	41.	16.	15.	4.	581.	0.	622.	RESIDUAL	622.	10	0.06	0.02	0.82
21 CC0822 GTST-08/22 HEAT	235.	477.	791.	310.	289.	85.	235.	-856.	1027.	RESIDUAL	170.	0	0.38	0.28	0.50
22 STIG15 STIG-15-16 POWR	235.	8.	39.	1.	15.	4.	599.	0.	639.	RESIDUAL	639.	10	0.02	0.02	0.80
22 STIG15 STIG-15-16 HEAT	235.	4910.	23846.	310.	9085.	2663.	235.	-28345.	24081.	RESIDUAL	-4263.	0	0.17	0.38	0.02
23 STIG10 STIG-10-16 POWR	235.	12.	42.	6.	15.	4.	593.	0.	635.	RESIDUAL	635.	10	0.03	0.02	0.80
23 STIG10 STIG-10-16 HEAT	235.	651.	2340.	310.	840.	246.	235.	-2579.	2575.	RESIDUAL	-4.	0	0.22	0.33	0.20
24 STIG1S STIG-1S-16 POWR	235.	13.	45.	9.	15.	4.	589.	0.	634.	RESIDUAL	634.	10	0.03	0.02	0.80
24 STIG1S STIG-1S-16 HEAT	235.	435.	1471.	310.	493.	144.	235.	-1494.	1706.	RESIDUAL	212.	0	0.23	0.29	0.30
25 DEADV3 DIESEL-ADV POWR	235.	17.	40.	9.	15.	4.	589.	0.	630.	RESIDUAL	630.	0	0.04	0.02	0.81
25 DEADV3 DIESEL-ADV HEAT	235.	585.	1381.	310.	512.	150.	235.	-1554.	1617.	RESIDUAL	62.	0	0.30	0.32	0.32
26 DEADV2 DIESEL-ADV POWR	235.	19.	40.	10.	15.	4.	588.	0.	628.	RESIDUAL	628.	1	0.05	0.02	0.81
26 DEADV2 DIESEL-ADV HEAT	235.	559.	1220.	310.	453.	133.	235.	-1368.	1456.	RESIDUAL	88.	1	0.31	0.31	0.35
27 DEADV1 DIESEL-ADV POWR	235.	25.	40.	16.	15.	4.	581.	0.	622.	RESIDUAL	622.	1	0.06	0.02	0.82
27 DEADV1 DIESEL-ADV HEAT	235.	491.	793.	310.	294.	86.	235.	-872.	1028.	RESIDUAL	156.	1	0.38	0.29	0.50
28 DEHTPM ADV-DIESEL POWR	235.	25.	44.	19.	15.	4.	578.	0.	622.	RESIDUAL	622.	0	0.06	0.02	0.82
28 DEHTPM ADV-DIESEL HEAT	235.	418.	719.	310.	247.	72.	235.	-725.	954.	RESIDUAL	229.	0	0.37	0.26	0.53
29 DESOA3 DIESEL-SOA POWR	235.	15.	42.	8.	15.	4.	591.	0.	632.	DISTILLA	632.	0	0.04	0.02	0.81
29 DESOA3 DIESEL-SOA HEAT	235.	573.	1628.	310.	588.	172.	235.	-1789.	1863.	DISTILLA	74.	0	0.26	0.32	0.27
29 DESOA3 DIESEL-SOA POWR	235.	15.	42.	8.	15.	4.	591.	0.	632.	RESIDUAL	632.	0	0.04	0.02	0.81
29 DESOA3 DIESEL-SOA HEAT	235.	573.	1628.	310.	588.	172.	235.	-1789.	1863.	RESIDUAL	74.	0	0.26	0.32	0.27

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

REPORT 5.1

I&SE PEO ADV DESIGN ENGR

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28651 MW 4.40 PROCESS MILLIONS BTU/HR 510.0 PROCESS TEMP(F) 320 PRODUCT STYRENE-MONO HOURS PER YEAR 7900

POWER TO HEAT RATIO 0.029

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 235 HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	235.	16.	42.	9.	15.	4.	589.	0.	631.	DISTILLA	631.	1	0.04	0.02	0.81
30 DESOA2 DIESEL-SOA HEAT	235.	545.	1409.	310.	509.	149.	235.	-1543.	1644.	DISTILLA	102.	1	0.28	0.31	0.31
30 DESOA2 DIESEL-SOA POWR	235.	16.	42.	9.	15.	4.	589.	0.	631.	RESIDUAL	631.	1	0.04	0.02	0.81
30 DESOA2 DIESEL-SOA HEAT	235.	545.	1409.	310.	509.	149.	235.	-1543.	1644.	RESIDUAL	102.	1	0.28	0.31	0.31
31 DESOA1 DIESEL-SOA POWR	235.	25.	42.	17.	15.	4.	580.	0.	622.	DISTILLA	622.	1	0.06	0.02	0.82
31 DESOA1 DIESEL-SOA HEAT	235.	464.	773.	310.	279.	82.	235.	-825.	1008.	DISTILLA	183.	1	0.37	0.28	0.51
31 DESOA1 DIESEL-SOA POWR	235.	25.	42.	17.	15.	4.	580.	0.	622.	RESIDUAL	622.	1	0.06	0.02	0.82
31 DESOA1 DIESEL-SOA HEAT	235.	464.	773.	310.	279.	82.	235.	-825.	1008.	RESIDUAL	183.	1	0.37	0.28	0.51
32 GTSOAD GT-HRSG-10 POWR	235.	24.	51.	24.	15.	4.	572.	0.	623.	DISTILLA	623.	10	0.06	0.02	0.82
32 GTSOAD GT-HRSG-10 HEAT	235.	306.	666.	310.	194.	57.	235.	-580.	901.	DISTILLA	340.	0	0.32	0.22	0.57
33 GTRA08 GT-85PE-08 POWR	235.	22.	42.	15.	15.	4.	582.	0.	625.	DISTILLA	625.	10	0.05	0.02	0.82
33 GTRA08 GT-85PE-08 HEAT	235.	466.	875.	310.	312.	92.	235.	-929.	1110.	DISTILLA	181.	0	0.35	0.28	0.46
34 GTRA12 GT-85PE-12 POWR	235.	23.	42.	15.	15.	4.	582.	0.	624.	DISTILLA	624.	10	0.06	0.02	0.82
34 GTRA12 GT-85PE-12 HEAT	235.	467.	857.	310.	307.	90.	235.	-912.	1093.	DISTILLA	180.	0	0.35	0.28	0.47
35 GTRA16 GT-85PE-16 POWR	235.	23.	43.	16.	15.	4.	581.	0.	624.	DISTILLA	624.	10	0.06	0.02	0.82
35 GTRA16 GT-85PE-16 HEAT	235.	439.	825.	310.	288.	84.	235.	-853.	1060.	DISTILLA	207.	0	0.35	0.27	0.48
36 GTR208 GT-60PE-08 POWR	235.	23.	47.	19.	15.	4.	577.	0.	624.	DISTILLA	624.	10	0.06	0.02	0.82
36 GTR208 GT-60PE-08 HEAT	235.	365.	751.	310.	240.	70.	235.	-704.	986.	DISTILLA	282.	0	0.33	0.24	[illegible]
37 GTR212 GT-60PE-12 POWR	235.	23.	45.	18.	15.	4.	579.	0.	624.	DISTILLA	624.	10	0.06	0.02	0.82
37 GTR212 GT-60PE-12 HEAT	235.	389.	781.	310.	258.	76.	235.	-758.	1016.	DISTILLA	258.	0	0.33	0.25	0.50
38 GTR216 GT-60PE-16 POWR	235.	23.	45.	18.	15.	4.	579.	0.	624.	DISTILLA	624.	10	0.06	0.02	0.82
38 GTR216 GT-60PE-16 HEAT	235.	406.	783.	310.	264.	77.	235.	-778.	1018.	DISTILLA	241.	0	0.34	0.26	0.50
39 GTRW08 GT-85PE-08 POWR	235.	19.	43.	12.	15.	4.	585.	0.	628.	DISTILLA	828.	10	0.05	0.02	0.81
39 GTRW08 GT-85PE-08 HEAT	235.	468.	1066.	310.	374.	110.	235.	-1122.	1301.	DISTILL	179.	0	0.31	0.29	0.39
40 GTRW12 GT-85PE-12 POWR	235.	20.	41.	12.	15.	4.	586.	0.	627.	DISTILLA	827.	10	0.05	0.02	0.81
40 GTRW12 GT-85PE-12 HEAT	235.	509.	1052.	310.	383.	112.	235.	-1150.	1287.	DISTILLA	138.	0	0.33	0.30	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28651 MW 4.40 PROCESS MILLIONS BTU/HR 510.0 PROCESS TEMP(F) 320. PRODUCT STYRENE-MONO HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.029

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 235. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	235.	20.	42.	13.	15.	4.	585.	0.	627.	DISTILLA	627.	10	0.05	0.02	0.81
41 GTRW16 GT-85RE-16 HEAT	235.	480.	1000.	310.	357.	105.	235.	-1089.	1235.	DISTILLA	167.	0	0.32	0.29	0.41
42 GTR308 GT-60RE-08 POWR	235.	18.	48.	16.	15.	4.	581.	0.	629.	DISTILLA	629.	10	0.04	0.02	0.81
42 GTR308 GT-60RE-08 HEAT	235.	336.	921.	310.	285.	84.	235.	-845.	1156.	DISTILLA	311.	0	0.27	0.25	0.44
43 GTR312 GT-60RE-12 POWR	235.	20.	44.	15.	15.	4.	583.	0.	626.	DISTILLA	626.	10	0.05	0.02	0.81
43 GTR312 GT-60RE-12 HEAT	235.	428.	918.	310.	314.	92.	235.	-935.	1154.	DISTILLA	219.	0	0.32	0.27	0.44
44 GTR316 GT-60RE-16 POWR	235.	20.	44.	15.	15.	4.	582.	0.	627.	DISTILLA	627.	10	0.05	0.02	0.81
44 GTR316 GT-60RE-16 HEAT	235.	419.	913.	310.	309.	91.	235.	-920.	1148.	DISTILLA	228.	0	0.31	0.27	0.44
45 FCPADS FUEL-CL-PH POWR	235.	15.	40.	7.	15.	4.	592.	0.	632.	DISTILLA	632.	0	0.04	0.02	0.81
45 FCPADS FUEL-CL-PH HEAT	235.	707.	1824.	310.	693.	203.	235.	-2119.	2059.	DISTILLA	-60.	0	0.28	0.34	0.25
46 FCMCDS FUEL-CL-MO POWR	235.	20.	36.	8.	15.	4.	590.	0.	626.	DISTILLA	626.	0	0.05	0.02	0.81
46 FCMCDS FUEL-CL-MO HEAT	235.	747.	1330.	310.	548.	161.	235.	-1666.	1566.	DISTILLA	-100.	0	0.36	0.35	0.33

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I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 26652 MW 0.60 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CUMENE-BENZE HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	0	0.	0.32	0.
1	STM141	STM-TURB-1	POWR	0.	0.	6.	3.	2.	1.	-4.	0.	6.	RESIDUAL	6.	11	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	0.	6.	3.	2.	1.	-4.	0.	6.	COAL-FGD	6.	11	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL-FGD	6.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	0.	6.	3.	2.	1.	-4.	0.	6.	COAL-AFB	[illegible]	11	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL-AFB	[illegible]	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-0.	7.	4.	2.	1.	-4.	0.	7.	RESIDUAL	[illegible]	11	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	[illegible]	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-0.	7.	4.	2.	1.	-4.	0.	7.	COAL-FGD	7.	11	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL-FGD	6.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-0.	7.	4.	2.	1.	-4.	0.	7.	COAL-AFB	7.	11	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL-AFB	6.	111	0.	0.	0.
3	PFBSTM	PFB-STMTB-	POWR	0.	1.	5.	3.	2.	1.	-3.	0.	5.	COAL-PFB	5.	11	0.17	0.38	0.
3	PFBSTM	PFB-STMTB-	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL PFB	6.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	1.	5.	2.	2.	1.	-2.	0.	5.	RESIDUAL	5.	11	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	1.	5.	2.	2.	1.	-2.	0.	5.	COAL	5.	11	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL	6.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-8.	15.	10.	2.	1.	-12.	0.	15.	RESIDUAL	15.	11	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-8.	15.	10.	2.	1.	-12.	0.	15.	COAL	15.	11	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL	6.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-0.	7.	3.	2.	1.	-3.	0.	7.	DISTILLA	7.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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INDUSTRY 28652 MW 0.60 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CUMENE-BENZE HOURS PER YEAR 8400

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-0.	7.	3.	2.	1.	-3.	0.	7.	RESIDUAL	7.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-0.	7.	3.	2.	1.	-3.	0.	7.	COAL	7.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL	6	111	0.	0.	0.
7 HEGT85 HELIUM-GT- POWR	0.	0.	6.	3.	2.	1.	-3.	0.	6.	COAL-AFB	6.	11	0.00	0.32	0.
7 HEGT85 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL-AFB	6.	111	0.	0.	0.
8 HEGT60 HELIUM-GT- POWR	0.	-2.	8.	3.	2.	1.	-4.	0.	8.	COAL-AFB	8.	11	-0.24	0.26	0.
8 HEGT60 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL-AFB	6.	111	0.	0.	0.
9 HEGT00 HELIUM-GT- POWR	0.	-5.	12.	7.	2.	1.	-8.	0.	12.	COAL-AFB	12.	11	-0.82	0.18	0.
9 HEGT00 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL-AFB	6.	111	0.	0.	0.
10 FCMCCL FUEL-CL-MO POWR	0.	-0.	7.	3.	2.	1.	-4.	0.	7.	COAL	7.	11	-0.05	0.30	0.
10 FCMCCL FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL	6.	111	0.	0.	0.
11 FCSTCL FUEL-CL-ST POWR	0.	2.	4.	1.	2.	1.	-1.	0.	4.	COAL	4.	11	0.35	0.49	0.
11 FCSTCL FUEL-CL-ST HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL	6.	111	0.	0.	0.
12 IGGTST INT-GAS-GT POWR	0.	1.	5.	2.	2.	1.	-2.	0.	5.	COAL	5.	11	0.20	0.40	0.
12 IGGTST INT-GAS-GT HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	COAL	6.	111	0.	0.	0.
13 GTSOAR GT-HRSG-10 POWR	0.	-1.	7.	3.	2.	1.	-4.	0.	7.	RESIDUAL	7.	11	-0.10	0.29	0.
13 GTSOAR GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
14 GTAC08 GT-HRSG-08 POWR	0.	-1.	8.	4.	2.	1.	-4.	0.	8.	RESIDUAL	8.	11	-0.19	0.27	0.
14 GTAC08 GT-HRSG-08 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
15 GTAC12 GT-HRSG-12 POWR	0.	-0.	7.	3.	2.	1.	-4.	0.	7.	RESIDUAL	7.	11	-0.05	0.31	0.
15 GTAC12 GT-HRSG-12 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
16 GTAC16 GT-HRSG-16 POWR	0.	0.	6.	3.	2.	1.	-4.	0.	6.	RESIDUAL	6.	11	0.01	0.32	0.
16 GTAC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
17 GTWC16 GT-HRSG-16 POWR	0.	-0.	6.	3.	2.	1.	-3.	0.	6.	RESIDUAL	6.	11	-0.02	0.32	0.
17 GTWC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.

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UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	2.	4.	1.	2.	1.	-1.	0.	4.	RESIDUAL	4.	11	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0
19 CC1622 GTST-16/22 POWR	0.	2.	4.	1.	2.	1.	-1.	0.	4.	RESIDUAL	4.	11	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0	0.	0
20 CC1222 GTST-12/22 POWR	0.	2.	4.	1.	2.	1.	-1.	0.	4.	RESIDUAL	4.	11	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0	0.	0.
21 CC0822 GTST-08/22 POWR	0.	2.	4.	1.	2.	1.	-2.	0.	4.	RESIDUAL	4.	11	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0
22 STIG15 STIG-15-16 POWR	0.	1.	5.	0.	2.	1.	-0.	0.	5.	RESIDUAL	5.	11	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0	0
23 STIG10 STIG-10-16 POWR	0.	1.	6.	1.	2.	1.	-1.	0.	6.	RESIDUAL	6.	11	0.11	0.36	0
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0	0
24 STIGIS STIG-IS-16 POWR	0.	0.	6.	1.	2.	1.	-2.	0.	6.	RESIDUAL	6.	11	0.05	0.34	0
24 STIGIS STIG-IS-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0	0.
25 DEADV3 DIESEL-ADV POWR	0.	1.	6.	2.	2.	1.	-2.	0.	6.	RESIDUAL	6.	11	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0
26 DEADV2 DIESEL-ADV POWR	0.	1.	6.	1.	2.	1.	-2.	0.	6.	RESIDUAL	6.	11	0.14	0.37	0
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0	0.	0.	0.	0	6.	0.	RESIDUAL	6.	111	0.	0	0
27 DEADV1 DIESEL-ADV POWR	0.	1.	6	2.	2.	1.	-3.	0.	6.	RESIDUAL	6.	11	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0	0.
28 DEHTPM ADV-DIESEL POWR	0.	1.	5.	3.	2.	1.	-3.	0.	5.	RESIDUAL	5.	11	0.20	0.40	0
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0
29 DESOA3 DIESEL-SOA POWR	0.	1.	6.	2.	2.	1.	-2.	0.	6.	DISTILLA	6.	1	0.11	0.36	0
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0	0.
29 DESOA3 DIESEL-SOA POWR	0.	1.	6.	2.	2.	1.	-2.	0.	6.	RESIDUAL	6.	1	0.11	0.36	0
29 DESOA3 DIESEL-SOA HEAT	0.	0	0	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0	0	0

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UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	1.	6.	1.	2.	1.	-1.	0.	6.	DISTILLA	6.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
30 DESOA2 DIESEL-SOA POWR	0.	1.	6.	1.	2.	1.	-1.	0.	6.	RESIDUAL	6.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	1.	6.	2.	2.	1.	-3.	0.	6.	DISTILLA	6.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	1.	6.	2.	2.	1.	-3.	0.	6.	RESIDUAL	6.	1	0.11	0.36	0
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	RESIDUAL	6.	111	0.	0.	0
32 GTSOAD GT-HRSG-10 POWR	0.	-1.	7.	4.	2.	1.	-4.	0.	7.	DISTILLA	7.	11	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
33 GTRA08 GT-85RE-08 POWR	0.	1.	6.	2.	2.	1.	-3.	0.	6.	DISTILLA	6.	11	0.10	0.36	0.
33 GTRA08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0
34 GTRA12 GT-85RE-12 POWR	0.	1.	6.	2.	2.	1.	-3.	0.	6.	DISTILLA	6.	11	0.11	0.36	0.
34 GTRA12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0
35 GTRA16 GT-85RE-16 POWR	0.	1.	6.	2.	2.	1.	-3.	0.	6.	DISTILLA	6.	11	0.08	0.35	0.
35 GTRA16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0
36 GTR208 GT-60RE-08 POWR	0.	0.	6.	3.	2.	1.	-4.	0.	6.	DISTILLA	6.	11	0.	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0
37 GTR212 GT-60RE-12 POWR	0.	0.	6.	3.	2.	1.	-3.	0.	6.	DISTILLA	6.	11	0.03	0.33	0
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0
38 GTR216 GT-60RE-16 POWR	0.	0.	6.	3.	2.	1.	-3.	0.	6.	DISTILLA	6.	11	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
39 GTRW08 GT-85RE-08 POWR	0.	1.	6.	2.	2.	1.	-2.	0.	6.	DISTILLA	6.	11	0.09	0.35	0.
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
40 GTRW12 GT-85RE-12 POWR	0.	1.	6.	2.	2.	[illegible]	-2.	0.	6.	DISTILLA	6.	11	0.12	0.36	0.
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	[illegible]	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.

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UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	1.	6.	2.	2.	1.	-2.	0.	6.	DISTILLA	6.	11	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
42 GTR308 GT-60RE-08 POWR	0.	-0.	7.	3.	2.	1.	-3.	0.	7.	DISTILLA	7.	11	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	0.	6.	2.	2.	1.	-3.	0.	6.	DISTILLA	6.	11	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	0.	6.	2.	2.	1.	-3.	0.	6.	DISTILLA	6.	11	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	1.	5.	1.	2.	1.	-1.	0.	5.	DISTILLA	5.	11	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	1.	5.	1.	2.	1.	-1.	0.	5.	DISTILLA	5.	11	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	6.	0.	DISTILLA	6.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28653 MW 6.00 PROCESS MILLIONS BTU/HR 300.0 PROCESS TEMP(F) 489. PRODUCT PHENOL-ACETO HOURS PER YEAR 8200.

POWER TO HEAT RATIO 0.068

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	353.	64.	353.	COAL-FGD	417.	0	0.	0.05	0.72
1 STM141 STM-TURB-1 POWR	0.	40.	183.	135.	20.	6.	194.	0.	377.	RESIDUAL	377.	10	0.10	0.05	0.80
1 STM141 STM-TURB-1 HEAT	0.	89.	407.	300.	46.	13.	0.	-78.	407.	RESIDUAL	328.	0	0.18	0.11	0.74
1 STM141 STM-TURB-1 POWR	0.	40.	183.	135.	20.	6.	194.	0.	377.	COAL-FGD	377.	10	0.10	0.05	0.80
1 STM141 STM-TURB-1 HEAT	0.	89.	407.	300.	46.	13.	0.	-78.	407.	COAL-FGD	328.	0	0.18	0.11	0.74
1 STM141 STM-TURB-1 POWR	0.	40.	183.	135.	20.	6.	194.	0.	377.	COAL-AFB	377.	10	0.10	0.05	0.80
1 STM141 STM-TURB-1 HEAT	0.	89.	407.	300.	46.	13.	0.	-78.	407.	COAL-AFB	328.	0	0.18	0.11	0.74
2 STM088 STM-TURB-8 POWR	0.	40.	267.	207.	20.	6.	110.	0.	377.	RESIDUAL	377.	0	0.10	0.05	0.80
2 STM088 STM-TURB-8 HEAT	0.	58.	388.	300.	30.	9.	0.	-29.	388.	RESIDUAL	359.	0	0.13	0.08	0.77
2 STM088 STM-TURB-8 POWR	0.	40.	267.	207.	20.	6.	110.	0.	377.	COAL-FGD	377.	0	0.10	0.05	0.80
2 STM088 STM-TURB-8 HEAT	0.	58.	388.	300.	30.	9.	0.	-29.	388.	COAL-FGD	359.	0	0.13	0.08	0.77
2 STM088 STM-TURB-8 POWR	0.	40.	267.	207.	20.	6.	110.	0.	377.	COAL-AFB	377.	0	0.10	0.05	0.80
2 STM088 STM-TURB-8 HEAT	0.	58.	388.	300.	30.	9.	0.	-29.	388.	COAL-AFB	359.	0	0.13	0.08	0.77
3 PFBSTM PFB-STMTB- POWR	0.	39.	112.	74.	20.	6.	266.	0.	378.	COAL-PFB	378.	10	0.09	0.05	0.79
3 PFBSTM PFB-STMTB- HEAT	0.	157.	456.	300.	83.	24.	0.	-196.	456.	COAL-PFB	260.	0	0.26	0.18	0.66
4 TISTMT TI-STMTB-1 POWR	0.	39.	88.	54.	20.	5.	290.	0.	378.	RESIDUAL	378.	10	0.09	0.05	0.79
4 TISTMT TI-STMTB-1 HEAT	0.	219.	492.	300.	114.	34.	0.	-294.	492.	RESIDUAL	198.	0	0.31	0.23	0.61
4 TISTMT TI-STMTB-1 POWR	0.	39.	88.	54.	20.	6.	290.	0.	378.	COAL	378.	10	0.09	0.05	0.79
4 TISTMT TI-STMTB-1 HEAT	0.	219.	492.	300.	114.	34.	0.	-294.	492.	COAL	198.	0	0.31	0.23	0.61
5 TIHRSG THERMIONIC POWR	0.	21.	146.	87.	20.	6.	251.	0.	396.	RESIDUAL	396.	0	0.05	0.05	0.76
5 TIHRSG THERMIONIC HEAT	0.	72.	502.	300.	71.	21.	0.	-157.	502.	RESIDUAL	345.	0	0.13	0.14	0.60
5 TIHRSG THERMIONIC POWR	0.	21.	146.	87.	20.	6.	251.	0.	396.	COAL	396.	0	0.05	0.05	0.76
5 TIHRSG THERMIONIC HEAT	0.	72.	502.	300.	71.	21.	0.	-157.	502.	COAL	345.	0	0.13	0.14	0.60
6 STIRL STIRLING-1 POWR	0.	27.	93.	48.	20.	6.	297.	0.	390.	DISTILLA	390.	0	0.06	0.05	0.77
6 STIRL STIRLING-1 HEAT	0.	167.	589.	300.	129.	38.	0.	-339.	589.	DISTILLA	250.	0	0.22	0.22	0.51

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28653 MW 6.00 PROCESS MILLIONS BTU/HR 300.0 PROCESS TEMP(F) 489. PRODUCT PHENOL-ACETO HOURS PER YEAR 8200.

POWER TO HEAT RATIO 0.068

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	27.	93.	48.	20.	6.	297.	0.	390.	RESIDUAL	390.	0	0.06	0.05	0.77
6	STIRL	STIRLING-1	HEAT	0.	167.	589.	300.	129.	38.	0.	-339.	589.	RESIDUAL	250.	0	0.22	0.22	0.51
6	STIRL	STIRLING-1	POWR	0.	27.	93.	48.	20.	6.	297.	0.	390.	COAL	390.	0	0.06	0.05	0.77
6	STIRL	STIRLING-1	HEAT	0.	167.	589	300.	129.	38.	0.	-339.	589.	COAL	250.	0	0.22	0.22	0.51
7	HEGT85	HELIUM-GT-	POWR	0.	-7.	64.	-6.	20.	6.	360.	0.	424.	COAL-AFB	424.	11	-0.02	0.05	0.71
7	HEGT85	HELIUM-GT-	HEAT	-3167.	343.	-3167.	300.	-1016.	-298.	0.	3240.	-3167.	COAL-AFB	74.	11	-6.77	*****	4.06
8	HEGT60	HELIUM-GT-	POWR	0.	-1.	79.	12.	20.	6.	339.	0.	418.	COAL-AFB	418.	10	-0.00	0.05	0.72
8	HEGT60	HELIUM-GT-	HEAT	0.	-28.	1999.	300.	518.	152.	0.	-1554.	1999.	COAL-AFB	445.	0	-0.01	0.26	0.15
9	HEGT00	HELIUM-GT-	POWR	0.	11.	116.	54.	20.	6.	290.	0.	406.	COAL-AFB	406.	10	0.03	0.05	0.74
9	HEGT00	HELIUM-GT-	HEAT	0.	61.	648.	300.	114.	33.	0.	-292.	648.	COAL-AFB	356.	10	0.09	0.18	0.46
10	FCMCCL	FUEL-CL-MO	POWR	0.	34.	67.	32.	20.	6.	316.	0.	383.	COAL	383.	10	0.08	0.05	0.78
10	FCMCCL	FUEL-CL-MO	HEAT	0.	321.	638.	300.	194.	57.	0.	-542.	638.	COAL	96.	10	0.33	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	35.	56.	23.	20.	6.	326.	0.	382.	COAL	382.	10	0.08	0.05	0.79
11	FCSTCL	FUEL-CL-ST	HEAT	0.	458.	727.	300.	266.	78.	0.	-768.	727.	COAL	-42.	10	0.39	0.37	0.41
12	IGGTST	INT-GAS-GT	POWR	0.	27.	77.	34.	20.	6.	313.	0.	390.	COAL	390.	10	0.07	0.05	0.77
12	IGGTST	INT-GAS-GT	HEAT	0.	241.	677.	300.	181.	53.	0.	-501.	677.	COAL	176.	10	0.26	0.27	0.44
13	GTSOAR	GT-HRSG-10	POWR	0.	25.	71.	27.	20.	6.	321.	0.	392.	RESIDUAL	392.	10	0.06	0.05	0.77
13	GTSOAR	GT-HRSG-10	HEAT	0.	279.	784.	300.	227.	67.	0.	-647.	784.	RESIDUAL	137.	0	0.26	0.29	0.38
14	GTAC08	GT-HRSG-08	POWR	0.	34.	76.	39.	20.	6.	307.	0.	383.	RESIDUAL	383.	10	0.08	0.05	0.78
14	GTAC08	GT-HRSG-08	HEAT	0.	262.	582.	300.	157.	46.	0.	-427.	582.	RESIDUAL	155.	0	0.31	0.27	0.52
15	GTAC12	GT-HRSG-12	POWR	0.	33.	67.	31.	20.	6.	316.	0.	383.	RESIDUAL	383.	10	0.08	0.05	0.78
15	GTAC12	GT-HRSG-12	HEAT	0.	323.	647.	300.	197.	58.	0.	-553.	647.	RESIDUAL	94.	0	0.33	0.31	0.46
16	GTAC16	GT-HRSG-16	POWR	0.	32.	63.	27.	20.	6.	322.	0.	385.	RESIDUAL	385.	10	0.08	0.05	0.78
16	GTAC16	GT-HRSG-16	HEAT	0.	360.	713.	300.	230.	68.	0.	-656.	713.	RESIDUAL	57.	0	0.34	0.32	0.42
17	GTWC16	GT-HRSG-16	POWR	0.	30.	65.	26.	20.	6.	322.	0.	387.	RESIDUAL	387.	10	0.07	0.05	0.78
17	GTWC16	GT-HRSG-16	HEAT	0.	341.	740.	300.	233.	68.	0.	-664.	740.	RESIDUAL	76.	0	0.32	0.32	0.41

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28653 MW 6.00 PROCESS MILLIONS BTU/HR 300.0 PROCESS TEMP(F) 489. PRODUCT PHENOL-ACETO HOURS PER YEAR 8200.

POWER TO HEAT RATIO 0.068

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	[illegible] PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	29.	56.	18.	20.	6.	332.	0.	388.	RESIDUAL	388.	10	0.07	0.05	0.77
18 CC1626 GTST-16/26 HEAT	0.	462.	928.	300.	338.	99.	0.	-993.	928.	RESIDUAL	-65.	0	0.34	0.38	0.32
19 CC1622 GTST-16/22 POWR	0	31.	57.	20.	20.	6.	329.	0.	386.	RESIDUAL	386.	10	0.07	0.05	0.78
19 CC1622 GTST-16/22 HEAT	0.	454.	847.	300.	303.	89.	0.	-884.	847.	RESIDUAL	-37.	0	0.35	0.38	0.35
20 CC1222 GTST-12/22 POWR	0.	31.	57.	20.	20.	6.	329.	0.	386.	RESIDUAL	386.	10	0.07	0.05	0.78
20 CC1222 GTST-12/22 HEAT	0.	455.	839.	300.	301.	88.	0.	-878.	839.	RESIDUAL	-38.	0	0.35	0.38	0.36
21 CC0822 GTST-08/22 POWR	0.	33.	61.	26.	20.	6.	322.	0.	384.	RESIDUAL	384.	10	0.08	0.05	0.78
21 CC0822 GTST-08/22 HEAT	0.	384.	709.	300.	237.	69.	0.	-677.	709.	RESIDUAL	33.	0	0.35	0.33	0.42
22 STIG15 STIG-15-16 POWR	0.	11.	54.	1.	20.	6.	352.	0.	406.	RESIDUAL	406.	11	0.03	0.05	0.74
22 STIG15 STIG-15-16 HEAT	0.	4752.	23077.	300.	8792.	2577.	0.	-27412.	23077.	RESIDUAL	-4335.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	16.	57.	8.	20.	6.	344.	0.	401.	RESIDUAL	401.	11	0.04	0.05	0.75
23 STIG10 STIG-10-16 HEAT	0.	630.	2264.	300.	813.	238.	0.	-2477.	2264.	RESIDUAL	-213.	1	0.22	0.36	0.13
24 STIGIS STIG-IS-16 POWR	0.	18.	61.	13.	20.	6.	338.	0.	399.	RESIDUAL	399.	11	0.04	0.05	0.75
24 STIGIS STIG-IS-16 HEAT	0.	421.	1423.	300.	477.	140.	0.	-1427.	1423.	RESIDUAL	-4.	1	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	19.	55.	8.	20.	6.	343.	0.	398.	RESIDUAL	398.	1	0.04	0.05	0.75
25 DEADV3 DIESEL-ADV HEAT	0.	666.	1961.	300.	728.	213.	0.	-2210.	1961.	RESIDUAL	-249.	1	0.25	0.37	0.15
26 DEADV2 DIESEL-ADV POWR	0.	25.	55.	14.	20.	6.	336.	0.	392.	RESIDUAL	392.	1	0.06	0.05	0.77
26 DEADV2 DIESEL-ADV HEAT	0.	541.	1181.	300.	438.	128.	0.	-1305.	1181.	RESIDUAL	-124.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	34.	55.	22.	20.	6.	328.	0.	383.	RESIDUAL	383.	1	0.08	0.05	0.78
27 DEADV1 DIESEL-ADV HEAT	0.	475.	767.	300.	285.	83.	0.	-826.	767.	RESIDUAL	-58.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	27.	75.	32.	20.	6.	315.	0.	390.	RESIDUAL	390.	0	0.06	0.05	0.77
28 DEHTPM ADV-DIESEL HEAT	0.	249.	695.	300.	189.	55.	0.	-527.	695.	RESIDUAL	168.	0	0.26	0.27	0.43
29 DESOA3 DIESEL-SOA POWR	0.	15.	57.	7.	20.	6.	345.	0.	402.	DISTILLA	402.	1	0.04	0.05	0.75
29 DESOA3 DIESEL-SOA HEAT	0.	676.	2522.	300.	910.	267.	0.	-2781.	2522.	DISTILLA	-259.	1	0.21	0.36	0.12
29 DESOA3 DIESEL-SOA POWR	0.	15.	57.	7.	20.	6.	345.	0.	402.	RESIDUAL	402.	1	0.04	0.05	0.75
29 DESOA3 DIESEL-SOA HEAT	0.	676.	2522.	300.	910.	267.	0.	-2781.	2522.	RESIDUAL	-259.	1	0.21	0.36	0.12

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28653 MW 6.00 PROCESS MILLIONS BTU/HR 300.0 PROCESS TEMP(F) 489. PRODUCT PHENOL-ACETO HOURS PER YEAR 8200.

POWER TO HEAT RATIO 0.068

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	22.	57.	12.	20.	6.	338.	0.	395.	DISTILLA	395.	1	0.05	0.05	0.76
30 DESOA2 DIESEL-SOA HEAT	0.	528.	1364.	300.	492.	144.	0.	-1474.	1364.	DISTILLA	-111.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	22.	57.	12.	20.	6.	338.	0.	395.	RESIDUAL	395.	1	0.05	0.05	0.76
30 DESOA2 DIESEL-SOA HEAT	0.	528.	1364.	300.	492.	144.	0.	-1474.	1364.	RESIDUAL	-111.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	34.	57.	23.	20.	6.	326.	0.	383.	DISTILLA	383.	1	0.08	0.05	0.78
31 DESOA1 DIESEL-SOA HEAT	0.	449.	748.	300.	270.	79.	0.	-780.	748.	DISTILLA	-32.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	34.	57.	23.	20.	6.	326.	0.	383.	RESIDUAL	383.	1	0.08	0.05	0.78
31 DESOA1 DIESEL-SOA HEAT	0.	449.	748.	300.	270.	79.	0.	-780.	748.	RESIDUAL	-32.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	31.	70.	32.	20.	6.	316.	0.	386.	DISTILLA	386.	10	0.07	0.05	0.78
32 GTSOAD GT-HRSG-10 HEAT	0.	295.	662.	300.	193.	57.	0.	-540.	662.	DISTILLA	122.	0	0.31	0.29	0.45
33 GTRA08 GT-85RE-08 POWR	0.	25.	57.	16.	20.	6.	334.	0.	392.	DISTILLA	392.	10	0.06	0.05	0.77
33 GTRA08 GT-85RE-08 HEAT	0.	479.	1094.	300.	391.	115.	0.	-1157.	1094.	DISTILLA	-63.	0	0.30	0.36	0.27
34 GTRA12 GT-85RE-12 POWR	0.	27.	57.	17.	20.	6.	333.	0.	390.	DISTILLA	390.	10	0.06	0.05	0.77
34 GTRA12 GT-85RE-12 HEAT	0.	474.	1018.	300.	365.	107.	0.	-1075.	1018.	DISTILLA	-57.	0	0.32	0.36	0.29
35 GTRA16 GT-85RE-16 POWR	0.	27.	59.	19.	20.	6.	331.	0.	390.	DISTILLA	390.	10	0.07	0.05	0.77
35 GTRA16 GT-85RE-16 HEAT	0.	438.	943.	300.	329.	96.	0.	-964.	943.	DISTILLA	-21.	0	0.32	0.35	0.32
36 GTR208 GT-60RE-08 POWR	0.	28.	64.	24.	20.	6.	325.	0.	389.	DISTILLA	389.	10	0.07	0.05	0.77
36 GTR208 GT-60RE-08 HEAT	0.	353.	811.	300.	259.	76.	0.	-747.	811.	DISTILLA	64.	0	0.30	0.32	0.37
37 GTR212 GT-60RE-12 POWR	0.	28.	62.	22.	20.	6.	327.	0.	389.	DISTILLA	389.	10	0.07	0.05	0.77
37 GTR212 GT-60RE-12 HEAT	0.	379.	845.	300.	279.	82.	0.	-807.	845.	DISTILLA	38.	0	0.31	0.33	0.36
38 GTR216 GT-60RE-16 POWR	0.	28.	61.	21.	20.	6.	328.	0.	389.	DISTILLA	389.	10	0.07	0.05	0.77
38 GTR216 GT-60RE-16 HEAT	0.	398.	853.	300.	287.	84.	0.	-834.	853.	DISTILLA	19.	0	0.32	0.34	0.35
39 GTRW08 GT-85RE-08 POWR	0.	22.	58.	14.	20.	6.	337.	0.	395.	DISTILLA	395.	10	0.05	0.05	0.76
39 GTRW08 GT-85RE-08 HEAT	0.	478.	1294.	300.	454.	133.	0.	-1355.	1294.	DISTILLA	-61.	0	0.27	0.35	0.23
40 GTRW12 GT-85RE-12 POWR	0.	24.	56.	14.	20.	6.	337.	0.	393.	DISTILLA	393.	10	0.06	0.05	0.76
40 GTRW12 GT-85RE-12 HEAT	0.	520.	1218.	300.	443.	130.	0.	-1321.	1218.	DISTILLA	-103.	0	0.30	0.36	0.25

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28653 MW 6.00 PROCESS MILLIONS BTU/HR 300.0 PROCESS TEMP(F) 489. PRODUCT PHENOL-ACETO HOURS PER YEAR 8200.

POWER TO HEAT RATIO 0.068

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	25.	57.	16.	20.	6.	335.	0.	392.	DISTILLA	392.	10	0.06	0.05	0.77
41 GTRW16 GT-85RE-16 HEAT	0.	481.	1108.	300.	396.	116.	0.	-1172.	[illegible]	DISTILLA	-64.	0	0.30	0.36	0.27
42 GTR308 GT-60RE-08 POWR	0.	20.	66.	18.	20.	6.	331.	0.	397.	DISTILLA	397.	10	0.05	0.05	0.76
42 GTR308 GT-60RE-08 HEAT	0.	319.	1077.	300.	334.	98.	0.	-979.	1077.	DISTILLA	98.	0	0.23	0.31	0.28
43 GTR312 GT-60RE-12 POWR	0.	26.	60.	19.	20.	6.	331.	0.	391.	DISTILLA	391.	10	0.06	0.05	0.77
43 GTR312 GT-60RE-12 HEAT	0.	418.	951.	300.	325.	95.	0.	-953.	951.	DISTILLA	-1.	0	0.31	0.34	0.32
44 GTR316 GT-60RE-16 POWR	0.	26.	60.	19.	20.	6.	330.	0.	391.	DISTILLA	391.	10	0.06	0.05	0.77
44 GTR316 GT-60RE-16 HEAT	0.	409.	942	300.	319.	94.	0.	-934.	942.	DISTILLA	8.	0	0.30	0.34	0.32
45 FCPADS FUEL-CL-PH POWR	0.	21.	54.	9.	20.	6.	342.	0.	396.	DISTILLA	396.	0	0.05	0.05	0.78
45 FCPADS FUEL-CL-PH HEAT	0.	684.	1765.	300.	671.	197.	0.	-2032.	1765.	DISTILLA	-267.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	28.	55.	12.	20.	6.	339.	0.	389.	DISTILLA	389.	0	0.07	0.06	0.77
46 FCMCDS FUEL-CL-MO HEAT	0.	723.	1288.	300.	530.	155.	0.	-1594.	1288.	DISTILLA	-306.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28654 MW 0.70 PROCESS MILLIONS BTU/HR 220.0 PROCESS TEMP(F) 489. PRODUCT ETHYLBENZENE HOURS PER YEAR 7900

POWER TO HEAT RATIO 0.011

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6* 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	259.	7.	259.	COAL-FGD	266.	0	0.	0.01	0.83
1 STM141 STM-TURB-1 POWR	0.	5.	40.	32.	2.	1.	221.	0.	262.	RESIDUAL	262.	10	0.02	0.01	0.84
1 STM141 STM-TURB-1 HEAT	0.	32.	278.	220.	16.	5.	0.	-44.	278.	RESIDUAL	234.	10	0.10	0.06	0.79
1 STM141 STM-TURB-1 POWR	0.	5.	40.	32.	2.	1.	221.	0.	262.	COAL-FGD	262.	10	0.02	0.01	0.84
1 STM141 STM-TURB-1 HEAT	0.	32.	278.	220.	16.	5.	0.	-44.	278.	COAL-FGD	234.	10	0.10	0.06	0.79
1 STM141 STM-TURB-1 POWR	0.	5.	40.	32.	2.	1.	221.	0.	262.	COAL-AFB	262.	10	0.02	0.01	0.84
1 STM141 STM-TURB-1 HEAT	0.	32.	278.	220.	16.	5.	0.	-44.	278.	COAL-AFB	234.	10	0.10	0.06	0.79
2 STM088 STM-TURB-8 POWR	0.	5.	108.	89.	2.	1.	154.	0.	262.	RESIDUAL	262.	11	0.02	0.01	0.84
2 STM088 STM-TURB-8 HEAT	0.	11.	266.	220.	6.	2.	0.	-11.	266.	RESIDUAL	255.	11	0.04	0.02	0.83
2 STM088 STM-TURB-8 POWR	0.	5.	108.	89.	2.	1.	154.	0.	262.	COAL-FGD	262.	11	0.02	0.01	0.84
2 STM088 STM-TURB-8 HEAT	0.	11.	266.	220.	6.	2.	0.	-11.	266.	COAL-FGD	255.	11	0.04	0.02	0.83
2 STM088 STM-TURB-8 POWR	0.	5.	108.	89.	2.	1.	154.	0.	262.	COAL-AFB	262.	11	0.02	0.01	0.84
2 STM088 STM-TURB-8 HEAT	0.	11.	266.	220.	6.	2.	0.	-11.	266.	COAL-AFB	255.	11	0.04	0.02	0.83
3 PFBSTM PFB-STMTB- POWR	0.	4.	18.	12.	2.	1.	244.	0.	262.	COAL-PFB	262.	10	0.02	0.01	0.84
3 PFBSTM PFB-STMTB- HEAT	0.	79.	314.	220.	43.	13.	0.	-126.	314.	COAL-PFB	188.	10	0.20	0.14	0.70
4 TISTMT TI-STMTB-1 POWR	0.	5.	13.	8.	2.	1.	249.	0.	262.	RESIDUAL	262.	10	0.02	0.01	0.84
4 TISTMT TI-STMTB-1 HEAT	0.	120.	336.	220.	63.	19.	0	-190.	336	RESIDUAL	146.	0	0.26	0.19	0.65
4 TISTMT TI-STMTB-1 POWR	0.	5.	13.	8.	2.	1.	249.	0.	262.	COAL	262.	10	0.02	0.01	0.84
4 TISTMT TI-STMTB-1 HEAT	0.	120.	336.	220.	63.	19.	0.	-190.	336.	COAL	146.	0	0.26	0.19	0.65
5 TIHRSG THERMIONIC POWR	0.	2.	17.	10.	2.	1.	247.	0.	264.	RESIDUAL	264.	10	0.01	0.01	0.83
5 TIHRSG THERMIONIC HEAT	0.	53.	368.	220.	52.	15.	0.	-154.	368.	RESIDUAL	214.	0	0.13	0.14	0.60
5 TIHRSG THERMIONIC POWR	0.	2.	17.	10.	2.	1.	247.	0.	264.	COAL	264.	10	0.01	0.01	0.83
5 TIHRSG THERMIONIC HEAT	0.	53.	368.	220.	52.	15.	0.	-154.	368.	COAL	214.	0	0.13	0.14	0.60
6 STIRL STIRLING-1 POWR	0.	3.	11.	6.	2.	1.	252.	0.	263.	DISTILLA	263.	0	0.01	0.01	0.84
6 STIRL STIRLING-1 HEAT	0.	123.	432.	220.	95.	28.	0.	-238.	432.	DISTILLA	144.	0	0.22	0.22	0.51

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

IND[illegible] 28654 MW 0.70 PROCESS MILLIONS BTU/HR 220.0 PROCESS TEMP(F) 489. PRODUCT ETHYLBENZENE HOUR PER YEAR 7900.

POWER TO HEAT RATIO 0.011

UTILI[illegible] FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	3.	11.	6.	2.	1.	252.	0.	263.	RESIDUAL	263.	0	0.01	0.01	0.84
6 STIRL STIRLING-1 HEAT	0.	123.	432.	220.	95.	28.	0.	-288.	432.	RESIDUAL	144.	0	0.22	0.22	0.51
6 STIRL STIRLING-1 POWR	0.	3.	11.	6.	2.	1.	252.	0.	263.	COAL	263.	0	0.01	0.01	0.84
6 STIRL STIRLING-1 HEAT	0.	123.	432.	220.	95.	28.	0.	-288.	432.	COAL	144.	0	0.22	0.22	0.51
7 HEGT85 HELIUM-GT- POWR	0.	-1.	7.	-1.	2.	1.	260.	0.	267.	COAL-AFB	267.	11	-0.00	0.01	0.82
7 HEGT85 HELIUM-GT- HEAT	-2322.	252.	-2322.	220.	-745.	-218.	0.	2337.	-2322.	COAL-AFB	15.	11	-7.78	*****	14.95
8 HEGT60 HELIUM-GT- POWR	0.	-0.	9.	1.	2.	1.	257.	0.	266.	COAL-AFB	266.	10	-0.00	0.01	0.83
8 HEGT60 HELIUM-GT- HEAT	0.	-21.	1466.	220.	380.	111.	0.	-1179.	1466.	COAL-AFB	287.	0	-0.01	0.26	0.15
9 HEGT00 HELIUM-GT- POWR	0.	1.	14.	6.	2.	1.	251.	0.	265.	COAL-AFB	265.	10	0.00	0.01	0.83
9 HEGT00 HELIUM-GT- HEAT	0.	45.	475.	220.	84.	25.	0.	-254.	475.	COAL-AFB	221.	10	0.09	0.18	0.46
10 FCMCCL FUEL-CL-MO POWR	0.	4.	8.	4.	2.	1.	254.	0.	262.	COAL	262.	10	0.01	0.01	0.84
10 FCMCCL FUEL-CL-MO HEAT	0.	235.	468.	220.	142.	42.	0.	-437.	468.	COAL	31.	10	0.33	0.30	0.47
11 FCSTCL FUEL-CL-ST POWR	0.	4.	7.	3.	2.	1.	255.	0.	262.	COAL	262.	10	0.02	0.01	0.84
11 FCSTCL FUEL-CL-ST HEAT	0.	286.	498.	220.	168.	49.	0.	-519.	498.	COAL	-20.	10	0.36	0.34	0.44
12 IGGTST INT-GAS-GT POWR	0.	3.	10.	5.	2.	1.	253.	0.	263.	COAL	263.	10	0.01	0.01	0.84
12 IGGTST INT-GAS-GT HEAT	0.	136.	463.	220.	109.	32.	0.	-333.	463.	COAL	130.	10	0.23	0.24	0.47
13 GTSOAR GT-HRSG-10 POWR	0.	3.	8.	3.	2.	1.	255.	0.	263.	RESIDUAL	263.	10	0.01	0.01	0.84
13 G[illegible]AR GT-HRSG-10 HEAT	0.	205.	575.	220.	167.	49.	0.	-514.	575.	RESIDUAL	61.	0	0.26	0.29	0.38
14 G[illegible] GT-HRSG-08 POWR	0.	4.	9.	5.	2.	1.	253.	0.	262.	RESIDUAL	262.	10	0.01	0.01	0.84
14 G[illegible] GT-HRSG-08 HEAT	0.	192.	427.	220.	115.	34.	0.	-352.	427.	RESIDUAL	74.	0	0.31	0.27	0.52
15 GTAC12 GT-HRSG-12 POWR	0.	4.	8.	4.	2.	1.	255.	0.	262.	RESIDUAL	262.	10	0.01	0.01	0.84
15 GTAC12 GT-HRSG-12 HEAT	0.	237.	475.	220.	145.	42.	0.	-445.	475.	RESIDUAL	30.	0	0.33	0.31	0.46
16 GTAC16 GT-HRSG-16 POWR	0.	4.	7.	3.	2.	1.	255.	0.	263.	RESIDUAL	263.	10	0.01	0.01	0.84
16 GTAC16 GT-HRSG-16 HEAT	0.	264.	523.	220.	169.	50.	0.	-520.	523.	RESIDUAL	3.	0	0.34	0.32	0.42
17 GTWC16 GT-HRSG-16 POWR	0.	3.	8.	3.	2.	1.	255.	0.	263.	RESIDUAL	263.	10	0.01	0.01	0.84
17 GTWC16 GT-HRSG-16 HEAT	0.	250.	542.	220.	171.	50.	0.	-526.	542.	RESIDUAL	16.	0	0.32	0.32	0.41

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28654 MW 0.70 PROCESS MILLIONS BTU/HR 220.0 PROCESS TEMP(F) 489. PRODUCT ETHYLBENZENE HOURS PER YEAR 7900

POWER TO HEAT RATIO 0.011

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	3.	7.	2.	2.	1.	256.	0.	263.	RESIDUAL	263.	11	0.01	0.01	0.84
18 CC1626 GTST-16/26 HEAT	0.	301.	635.	220.	217.	64.	0.	-670.	635.	RESIDUAL	-35.	1	0.32	0.34	0.35
19 CC1622 GTST-16/22 POWR	0.	3.	7.	3.	2.	1.	256.	0.	263.	RESIDUAL	263.	11	0.01	0.01	0.84
19 CC1622 GTST-16/22 HEAT	0.	283.	580.	220.	193.	57.	0.	-597.	580.	RESIDUAL	-17.	1	0.33	0.33	0.38
20 CC1222 GTST-12/22 POWR	0.	4.	7.	3.	2.	1.	256.	0.	263.	RESIDUAL	263.	11	0.01	0.01	0.84
20 CC1222 GTST-12/22 HEAT	0.	283.	574.	220.	191.	56.	0.	-591.	574.	RESIDUAL	-16.	1	0.33	0.33	0.38
21 CC0822 GTST-08/22 POWR	0.	4.	8.	4.	2.	1.	255.	0.	262.	RESIDUAL	262.	11	0.01	0.01	0.84
21 CC0822 GTST-08/22 HEAT	0.	234.	485.	220.	147.	43.	0.	-453.	485.	RESIDUAL	32.	1	0.33	0.30	0.45
22 STIG15 STIG-15-16 POWR	0.	1.	6.	0.	2	1.	259.	0.	265.	RESIDUAL	265.	11	0.00	0.01	0.83
22 STIG15 STIG-15-16 HEAT	0.	3485.	16923.	220.	6448.	1890.	0.	-20142.	16923.	RESIDUAL	-3218.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	2.	7.	1.	2	1.	258.	0.	264.	RESIDUAL	264.	11	0.01	0.01	0.83
23 STIG10 STIG-10-16 HEAT	0.	462.	1660.	220.	596.	175.	0.	-1856.	1660.	RESIDUAL	-195.	1	0.22	0.36	0.13
24 STIGIS STIG-1S-16 POWR	0.	2.	7.	2.	2.	1.	257.	0.	264.	RESIDUAL	264.	11	0.01	0.01	0.83
24 STIGIS STIG-1S-16 HEAT	0.	308.	1044.	220.	350.	103.	0.	-1086.	1044.	RESIDUAL	-42.	1	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	2.	6.	1.	2.	1.	258.	0.	264.	RESIDUAL	264.	11	0.01	0.01	0.83
25 DEADV3 DIESEL-ADV HEAT	0.	488.	1438.	220.	534.	156.	0.	-1660.	1438.	RESIDUAL	-222.	1	0.25	0.37	0.15
26 DEADV2 DIESEL-ADV POWR	0.	3.	6.	2.	2.	1.	257.	0.	263.	RESIDUAL	263.	11	0.01	0.01	0.84
26 DEADV2 DIESEL-ADV HEAT	0.	397.	866.	220.	321.	94.	0.	-997.	866.	RESIDUAL	-131.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	4.	6.	3.	2.	1.	256.	0.	262.	RESIDUAL	262.	11	0.01	0.01	0.84
27 DEADV1 DIESEL-ADV HEAT	0.	348.	563.	220.	209.	61.	0.	-645.	563.	RESIDUAL	-82.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	3.	9.	4.	2.	1.	254.	0.	263.	RESIDUAL	263.	10	0.01	0.01	0.84
28 DEHTPM ADV-DIESEL HEAT	0.	182.	510.	220.	139.	41.	0.	-426.	510.	RESIDUAL	84.	0	0.26	0.27	0.43
29 DESOA3 DIESEL-SOA POWR	0.	2.	7.	1.	2.	1.	258.	0.	265.	DISTILLA	265.	1	0.01	0.01	0.83
29 DESOA3 DIESEL-SOA HEAT	0.	496.	1849.	220.	668.	196.	0.	-2079.	1849.	DISTILLA	-229.	1	0.21	0.36	0.12
29 DESOA3 DIESEL-SOA POWR	0.	2.	7.	1.	2.	1.	258.	0.	265.	RESIDUAL	265.	1	0.01	0.01	0.83
29 DESOA3 DIESEL-SOA HEAT	0.	496.	1849.	220.	668.	196.	0.	-2079.	1849.	RESIDUAL	-229.	1	0.21	0.36	0.12

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28654 MW 0.70 PROCESS MILLIONS BTU/HR 220.0 PROCESS TEMP(F) 489. PRODUCT ETHYLBENZENE HOURS PER YEAR 7900

POWER TO HEAT RATIO 0.011

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	3.	7.	1.	2.	1.	257.	0	264	DISTILLA	264.	1	0.01	0.01	0.83
30	DESOA2	DIESEL-SOA	HEAT	0.	387.	1000.	220.	361.	106.	0.	-1121.	1000	DISTILLA	-121.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	3.	7.	1.	2.	1.	257.	0.	264	RESIDUAL	264.	1	0.01	0.01	0.83
30	DESOA2	DIESEL-SOA	HEAT	0.	387.	1000.	220.	361.	106.	0.	-1121.	1000	RESIDUAL	-121.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	4.	7.	3.	2.	1.	256.	0.	262	DISTILLA	262.	1	0.01	0.01	0.84
31	DESOA1	DIESEL-SOA	HEAT	0.	329.	549.	220.	198.	58.	0.	-611.	549	DISTILLA	-63.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	4.	7.	3.	2.	1.	256.	0.	262	RESIDUAL	262.	1	0.01	0.01	0.84
31	DESOA1	DIESEL-SOA	HEAT	0.	329.	549.	220.	198.	58.	0.	-611.	549	RESIDUAL	-63.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	4.	8.	4.	2.	1.	254.	0.	263	DISTILLA	263.	10	0.01	0.01	0.84
32	GTSOAD	GT-HRSG-10	HEAT	0.	216.	485.	220.	142.	42.	0.	-435.	485	DISTILLA	50.	0	0.31	0.29	0.45
33	GTRA08	GT-85RE-08	POWR	0.	3.	7.	2.	2.	1.	257.	0.	263	DISTILLA	263.	10	0.01	0.01	0.84
33	GTRA08	GT-85RE-08	HEAT	0.	352.	803.	220.	287.	84.	0.	-888.	803	DISTILLA	-85.	0	0.30	0.36	0.27
34	GTRA12	GT-85RE-12	POWR	0.	3.	7.	2.	2.	1.	257.	0.	263	DISTILLA	263.	10	0.01	0.01	0.84
34	GTRA12	GT-85RE-12	HEAT	0.	348.	747.	220.	267.	78.	0.	-828.	747	DISTILLA	-81.	0	0.32	0.36	0.29
35	GTRA16	GT-85RE-16	POWR	0.	3.	7.	2.	2.	1.	256.	0.	263	DISTILLA	263.	10	0.01	0.01	0.84
35	GTRA16	GT-85RE-16	HEAT	0.	321.	691.	220.	241.	71.	0.	-746.	691	DISTILLA	-55.	0	0.32	0.35	0.32
36	GTR208	GT-60RE-08	POWR	0.	3.	7.	3.	2.	1.	256.	0.	263	DISTILLA	263.	10	0.01	0.01	0.84
36	GTR208	GT-60RE-08	HEAT	0.	259.	595.	220.	190.	56.	0.	-587.	595	DISTILLA	7.	0	0.30	0.32	0.37
37	GTR212	GT-60RE-12	POWR	0.	3.	7.	3.	2.	1.	256.	0.	263	DISTILLA	263.	10	0.01	0.01	0.84
37	GTR212	GT-60RE-12	HEAT	0.	278.	619.	220.	204.	60.	0.	-631.	619	DISTILLA	-12.	0	0.31	0.33	0.36
38	GTR216	GT-60RE-16	POWR	0.	3.	7.	2.	2.	1.	256.	0.	263	DISTILLA	263.	10	0.01	0.01	0.84
38	GTR216	GT-60RE-16	HEAT	0.	292.	626.	220.	211.	62.	0.	-651.	626	DISTILLA	-26.	0	0.32	0.34	0.35
39	GTRW08	GT-85RE-08	POWR	0.	3.	7.	2.	2.	1.	257.	0.	264	DISTILLA	264.	10	0.01	0.01	0.83
39	GTRW08	GT-85RE-08	HEAT	0.	351.	949.	220.	333.	98.	0.	-1033.	949	DISTILLA	-84.	0	0.27	0.35	0.23
40	GTRW12	GT-85RE-12	POWR	0.	3.	7.	2.	2.	1.	257.	0.	263	DISTILLA	263.	10	0.01	0.01	0.83
40	GTRW12	GT-85RE-12	HEAT	0.	382.	893.	220.	325.	95.	0.	-1008.	893	DISTILLA	-115.	0	0.30	0.36	0.25

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28654 MW 0.70 PROCESS MILLIONS BTU/HR 220.0 PROCESS TEMP(F) 489. PRODUCT ETHYLBENZENE HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.011

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	3.	7.	2.	2.	1.	257.	0.	263.	DISTILLA	263.	10	0.01	0.01	0.84
41 GTRW16 GT-85RE-16 HEAT	0.	353.	813.	220.	290.	85.	0.	-899.	813.	DISTILLA	-86.	0	0.30	0.36	0.27
42 GTR308 GT-60RE-08 POWR	0.	2.	8.	2.	2.	1.	256.	0.	264.	DISTILLA	264.	10	0.01	0.01	0.83
42 GTR308 GT-60RE-08 HEAT	0.	234.	790.	220.	245.	72.	0.	-758.	790.	DISTILLA	32.	0	0.23	0.31	0.28
43 GTR312 GT-60RE-12 POWR	0.	3.	7.	2.	2.	1.	256.	0.	263.	DISTILLA	263.	10	0.01	0.01	0.84
43 GTR312 GT-60RE-12 HEAT	0.	307.	698.	220.	239.	70.	0.	-738.	698.	DISTILLA	-40.	0	0.31	0.34	0.32
44 GTR316 GT-60RE-16 POWR	0.	3.	7.	2.	2.	1.	256.	0.	263.	DISTILLA	263.	10	0.01	0.01	0.84
44 GTR316 GT-60RE-16 HEAT	0.	300.	691.	220.	234.	69.	0.	-725.	691.	DISTILLA	-34.	0	0.30	0.34	0.32
45 FCPADS FUEL-CL-PH POWR	0.	2.	6.	1.	2.	1.	258.	0.	264.	DISTILLA	264.	10	0.01	0.01	0.83
45 FCPADS FUEL-CL-PH HEAT	0.	501.	1294.	220.	492.	144.	0.	-1529.	1294.	DISTILLA	-235.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	3.	6.	1.	2.	1.	257.	0.	263.	DISTILLA	263.	10	0.01	0.01	0.84
46 FCMCDS FUEL-CL-MO HEAT	0.	530.	944.	220.	389.	114.	0.	-1208.	944.	DISTILLA	-264.	0	0.36	0.41	0.23

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28691 MW 1.50 PROCESS MILLIONS BTU/HR 133.0 PROCESS TEMP(F) 574. PRODUCT METHANOL-SYN HOURS PER YEAR 7880.

POWER TO HEAT RATIO 0.038

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	156.	0.	0.	0.	0.	0.	156.	16.	156	COAL-FGD	172.	0	0.	0.03	0.77
1 STM141 STM-TURB-1 POWR	170.	3.	170.	139.	5.	2.	-7.	0.	170	RESIDUAL	170.	11	1.00	0.03	0.78
1 STM141 STM-TURB-1 HEAT	162.	10.	162.	133.	5.	1.	0.	1.	162	RESIDUAL	163.	11	0.96	0.03	0.82
1 STM141 STM-TURB-1 POWR	170.	3.	170.	139.	5.	2.	-7.	0.	170	COAL-FGD	170.	11	1.00	0.03	0.78
1 STM141 STM-TURB-1 HEAT	162.	10.	162.	133.	5.	1.	0.	1.	162	COAL-FGD	163.	11	0.96	0.03	0.82
1 STM141 STM-TURB-1 POWR	170.	3.	170.	139.	5.	2.	-7.	0.	170	COAL-AFB	170.	11	1.00	0.03	0.78
1 STM141 STM-TURB-1 HEAT	162.	10.	162.	133.	5.	1.	0.	1.	162	COAL-AFB	163.	11	0.96	0.03	0.82
2 STM088 STM-TURB-8 POWR	162.	10.	-675.	-579.	5.	2.	837.	0.	162	RESIDUAL	162.	11	1.00	0.03	0.82
2 STM088 STM-TURB-8 HEAT	155.	-2.	155.	133.	-1.	-0.	0.	20.	155	RESIDUAL	175.	11	-0.23	-0.01	0.76
2 STM088 STM-TURB-8 POWR	162.	10.	-675.	-579.	5.	2.	837.	0.	162	COAL-FGD	162.	11	1.00	0.03	0.82
2 STM088 STM-TURB-8 HEAT	155.	-2.	155.	133.	-1.	-0.	0.	20.	155	COAL-FGD	175.	11	-0.23	-0.01	0.76
2 STM088 STM-TURB-8 POWR	162.	10.	-675.	-579.	5.	2.	837.	0.	162	COAL-AFB	162.	11	1.00	0.03	0.82
2 STM088 STM-TURB-8 HEAT	155.	-2.	155.	133.	-1.	-0.	0.	20.	155	COAL-AFB	175.	11	-0.23	-0.01	0.76
3 PFBSTM PFB-STMTB- POWR	163.	9.	46.	33.	5.	2.	117.	0.	163	COAL-PFB	163.	10	1.00	0.03	0.81
3 PFBSTM PFB-STMTB- HEAT	184.	37.	184.	133.	21.	6.	0.	-48.	184	COAL-PFB	136.	10	1.00	0.11	0.72
4 TISTMT TI-STMTB-1 POWR	132.	10.	31.	21.	5.	2.	132.	0.	163	RESIDUAL	163.	11	-0.95	0.03	0.82
4 TISTMT TI-STMTB-1 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156	RESIDUAL	172.	111	-0.00	0.	0.77
4 TISTMT TI-STMTB-1 POWR	163.	10.	31.	21.	5.	2.	132.	0.	163	COAL	163.	11	1.00	0.03	0.82
4 TISTMT TI-STMTB-1 HEAT	196.	61.	196.	133.	32.	9.	0.	-84.	196	COAL	112.	11	1.00	0.16	0.68
5 TIHRSG THERMIONIC POWR	133.	3.	36.	20.	5.	2.	133.	0.	169	RESIDUAL	169.	10	-1.27	0.03	0.79
5 TIHRSG THERMIONIC HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156	RESIDUAL	172.	110	-0.00	0.	0.77
5 TIHRSG THERMIONIC POWR	169.	3.	36.	20.	5.	2.	133.	0.	169	COAL	169.	10	1.00	0.03	0.79
5 TIHRSG THERMIONIC HEAT	239.	23.	239.	133.	34.	10.	0.	-89.	239	COAL	150.	0	1.00	0.14	0.56
6 STIRL STIRLING-1 POWR	140.	6.	27.	14.	5.	2.	140.	0.	166	DISTILLA	166.	1	-0.67	0.03	0.80
6 STIRL STIRLING-1 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156	DISTILLA	172.	111	-0.00	0.	0.77

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 23631 MW 1.50 PROCESS MILLIONS BTU/HR 133.0 PROCESS TEMP(F) 574 PRODUCT METHANOL-SYN HOURS PER YEAR 7860

POWER TO HEAT RATIO 0.038

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353 HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	140.	6.	27.	14.	5.	2.	140.	0	166	RESIDUAL	166.	1	-0.67	0.03	0.80
6 STIRL STIRLING-1 HEAT	156.	0	0.	0.	0.	0.	156	16.	156	RESIDUAL	172.	111	-0.00	0	0.77
6 STIRL STIRLING-1 POWR	166.	6.	27.	14.	5.	2.	140	0.	166	COAL	166.	1	1.00	0.03	0.80
6 STIRL STIRLING-1 HEAT	248.	57.	248.	133.	48.	14.	0.	-133.	248	COAL	115.	1	1.00	0.19	0.54
7 HEGT85 HELIUM-GT- POWR	178.	-5.	16.	-4.	5.	2.	162	0.	178	COAL-AFB	178.	11	1.00	0.03	0.75
7 HEGT85 HELIUM-GT- HEAT	-489.	155.	-489.	133.	-157.	-46.	0.	506.	-489	COAL-AFB	18.	11	*****	-8.96	7.59
8 HEGT60 HELIUM-GT- POWR	176.	-3.	20.	1.	5.	2.	156.	0.	176	COAL-AFB	178.	11	1.00	0.03	0.76
8 HEGT60 HELIUM-GT- HEAT	353.	-844.	5246.	133.	1359.	398.	0	-4230	5246	COAL-AFB	1016.	1	-0.15	0.26	0.03
9 HEGT00 HELIUM-GT- POWR	170.	2.	29.	13.	5.	2.	141.	0.	170	COAL-AFB	170.	10	1.00	0.03	0.78
9 HEGT00 HELIUM-GT- HEAT	296.	23.	296.	133.	52.	15.	0	-147	296	COAL-AFB	149.	10	1.00	0.18	0.45
10 FCMCCL FUEL-CL-MO POWR	0.	8.	17.	8.	5.	2.	147.	0	164	COAL	164.	10	-9.26	0.03	0.81
10 FCMCCL FUEL-CL-MO HEAT	0.	142.	284.	133.	86.	25.	0	-254	284	COAL	30.	10	-0.05	0.30	0.47
11 FCSTCL FUEL-CL-ST POWR	0.	9.	16.	7.	5.	2.	148	0	164	COAL	164.	11	-9.24	0.03	0.81
11 FCSTCL FUEL-CL-ST HEAT	0.	159.	291.	133.	94.	28.	0	-277	291	COAL	14.	11	0.01	0.32	0.46
12 IGGTST INT-GAS-GT POWR	0.	6.	23.	12.	5.	2.	143.	0	166	COAL	166.	11	-9.40	0.03	0.80
12 IGGTST INT-GAS-GT HEAT	0.	70.	270.	133.	59.	17.	0	-168	270	COAL	102.	11	-0.47	0.22	0.49
13 GTSOAR GT-HRSG-10 POWR	149.	6.	18.	6.	5.	2.	149.	0.	167	RESIDUAL	167.	10	-0.10	0.03	0.80
13 GTSOAR GT-HRSG-10 HEAT	156.	0.	0.	0.	0.	0.	156	16	156	RESIDUAL	172.	110	-0.00	0	0.77
14 GTAC08 GT-HRSG-08 POWR	145.	8.	19.	10.	5.	2.	145.	0.	164	RESIDUAL	164.	10	-0.19	0.03	0.81
14 GTAC08 GT-HRSG-08 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156	RESIDUAL	172	110	-0.00	0	0.77
15 GTAC12 GT-HRSG-12 POWR	147.	8.	17.	8.	5.	2.	147.	0	164	RESIDUAL	164.	10	-0.05	0.03	0.81
15 GTAC12 GT-HRSG-12 HEAT	156.	0.	0.	0.	0.	0.	156.	16	156	RESIDUAL	172.	110	-0.00	0	0.77
16 GTAC16 GT-HRSG-16 POWR	149.	8.	16.	7.	5.	2.	149	0.	165	RESIDUAL	165.	10	0.01	0.03	0.81
16 GTAC16 GT-HRSG-16 HEAT	156.	0	0.	0.	0.	0.	156.	16	156	RESIDUAL	172.	110	-0.00	0	0.77
17 GTWC16 GT-HRSG-16 POWR	149.	8.	16.	7.	5.	2.	149	0.	165	RESIDUAL	165.	10	-0.02	0.03	0.81
17 GTWC16 GT-HRSG-16 HEAT	156.	0	0.	0.	0.	0.	156.	16.	156	RESIDUAL	172.	110	-0.00	0	0.77

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&E PEG ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28[illegible]1 MW 1.50 PROCESS MILLIONS BTU/HR 133.0 PROCESS TEMP(F) 574. PRODUCT METHANOL-SYN HOURS PER YEAR 7660.

POWER TO HEAT RATIO 0.038

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	150.	7.	16.	6.	5.	2.	150.	0.	165.	RESIDUAL	165.	11	0.03	0.03	0.80
18	CC1626	GTST-16/26	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
19	CC1622	GTST-16/22	POWR	149.	7.	16.	6.	5.	2.	149.	0.	165.	RESIDUAL	165.	11	-0.00	0.03	0.81
19	CC1622	GTST-16/22	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
20	CC1222	GTST-12/22	POWR	149.	7.	16.	6.	5.	2.	149.	0.	165.	RESIDUAL	165.	11	-0.00	0.03	0.81
20	CC1222	GTST-12/22	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
21	CC0822	GTST-08/22	POWR	147.	8.	18.	8.	5.	2.	147.	0.	164.	RESIDUAL	164.	11	-0.11	0.03	0.81
21	CC0822	GTST-08/22	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
22	STIG15	STIG-15-16	POWR	156.	3.	13.	0.	5.	2.	156.	0.	170.	RESIDUAL	170.	11	0.16	0.03	0.78
22	STIG15	STIG-15-16	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
23	STIG10	STIG-10-16	POWR	154.	4.	14.	2.	5.	2.	154.	0.	169.	RESIDUAL	169.	11	0.11	0.03	0.79
23	STIG10	STIG-10-16	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
24	STIGIS	STIG-IS-16	POWR	153.	5.	15.	3.	5.	2.	153.	0.	168.	RESIDUAL	168.	11	0.05	0.03	0.79
24	STIGIS	STIG-IS-16	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
25	DEADV3	DIESEL-ADV	POWR	155.	4.	14.	2.	5.	2.	155.	0.	168.	RESIDUAL	168.	11	0.14	0.03	0.79
25	DEADV3	DIESEL-ADV	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
26	DEADV2	DIESEL-ADV	POWR	152.	6	14.	4.	5.	2.	152.	0.	166.	RESIDUAL	166.	11	0.14	0.03	0.80
26	DEADV2	DIESEL-ADV	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
27	DEADV1	DIESEL-ADV	POWR	150.	9.	14.	5.	5.	2.	150.	0.	164.	RESIDUAL	164.	11	0.14	0.03	0.81
27	DEADV1	DIESEL-ADV	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
28	DEHTPM	ADV-DIESEL	POWR	145.	5.	23.	10.	5.	2.	145.	0.	167.	RESIDUAL	167.	11	-0.42	0.03	0.79
28	DEHTPM	ADV-DIESEL	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
29	DESOA3	DIESEL-SOA	POWR	155.	3.	14.	1.	5.	2.	155.	0.	169.	DISTILLA	169.	1	0.11	0.03	0.79
29	DESOA3	DIESEL-SOA	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	111	-0.00	0.	0.77
29	DESOA3	DIESEL-SOA	POWR	155.	3.	14.	1.	5.	2.	155.	0.	169.	RESIDUAL	169.	1	0.11	0.03	0.79
29	DESOA3	DIESEL-SOA	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28691 MW 1.50 PROCESS MILLIONS BTU/HR 133.0 PROCESS TEMP(F) 574. PRODUCT METHANOL-SYN HOURS PER YEAR 7880.

POWER TO HEAT RATIO 0.033

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	[illegible]IL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	153.	5.	14.	3.	5.	2.	153.	0.	167.	DISTILLA	167.	1	0.11	0.03	0.80
30 DESOA2 DIESEL-SOA HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	111	-0.00	0.	0.77
30 DESOA2 DIESEL-SOA POWR	153.	5.	14.	3.	5.	2.	153.	0.	167.	RESIDUAL	167.	1	0.11	0.03	0.80
30 DESOA2 DIESEL-SOA HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
31 DESOA1 DIESEL-SOA POWR	150.	9.	14.	6.	5.	2.	150.	0.	164.	DISTILLA	164.	1	0.11	0.03	0.81
31 DESOA1 DIESEL-SOA HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	111	-0.00	0.	0.77
31 DESOA1 DIESEL-SOA POWR	150.	9.	14.	6.	5.	2.	150.	0.	164.	RESIDUAL	164.	1	0.11	0.03	0.81
31 DESOA1 DIESEL-SOA HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	RESIDUAL	172.	111	-0.00	0.	0.77
32 GTSOAD GT-HRSG-10 POWR	147.	8.	18.	8.	5.	2.	147.	0.	165.	DISTILLA	165.	10	-0.10	0.03	0.81
32 GTSOAD GT-HRSG-10 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
33 GTRA08 GT-85RE-08 POWR	153.	5.	14.	3.	5.	2.	153.	0.	167.	DISTILLA	167.	10	0.10	0.03	0.80
33 GTRA08 GT-85RE-08 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
34 GTRA12 GT-85RE-12 POWR	152.	6.	14.	4.	5.	2.	152.	0.	167.	DISTILLA	167.	10	0.11	0.03	0.80
34 GTRA12 GT-85RE-12 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
35 GTRA16 GT-85RE-16 POWR	152.	6.	15.	4.	5.	2.	152.	0.	166.	DISTILLA	166.	10	0.08	0.03	0.80
35 GTRA16 GT-85RE-16 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
36 GTR208 GT-60RE-08 POWR	150.	6.	16.	6.	5.	2.	150.	0.	166.	DISTILLA	166.	10	-0.00	0.03	0.80
36 GTR208 GT-60RE-08 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
37 GTR212 GT-60RE-12 POWR	150.	7.	16.	5.	5.	2.	150.	0.	166.	DISTILLA	166.	10	0.03	0.03	0.80
37 GTR212 GT-60RE-12 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
38 GTR216 GT-60RE-16 POWR	151.	7.	15.	5.	5.	2.	151.	0.	166.	DISTILLA	166.	10	0.05	0.03	0.80
38 GTR216 GT-60RE-16 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
39 GTRW08 GT-85RE-08 POWR	153.	5.	15.	3.	5.	2.	153.	0.	168.	DISTILLA	168.	10	0.09	0.03	0.79
39 GTRW08 GT-85RE-08 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
40 GTRW12 GT-85RE-12 POWR	153.	5.	14.	3..	5.	2.	153.	0.	167.	DISTILLA	167.	10	0.12	0.03	0.80
40 GTRW12 GT-85RE-12 HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28691 MW 1.50 PROCESS MILLIONS BTU/HR 133.0 PROCESS TEMP(F) 574. PRODUCT METHANOL-SYN HOURS PER YEAR 7880.

POWER TO HEAT RATIO 0.038

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 353. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	GTRW16	GT-85RE-16	POWR	152.	6.	14.	4.	5.	2.	152.	0.	167.	DISTILLA	167.	10	0.10	0.03	0.80
41	GTRW16	GT-85RE-16	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
42	GTR308	GT-60RE-08	POWR	152.	4.	17.	4.	5.	2.	152.	0.	168.	DISTILLA	168.	10	-0.03	0.03	0.79
42	GTR308	GT-60RE-08	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
43	GTR312	GT-60RE-12	POWR	151.	6.	15.	5.	5.	2.	151.	0.	166.	DISTILLA	166.	10	0.06	0.03	0.80
43	GTR312	GT-60RE-12	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
44	GTR316	GT-60RE-16	POWR	151.	6.	15.	5.	5.	2.	151.	0.	166.	DISTILLA	166.	10	0.06	0.03	0.80
44	GTR316	GT-60RE-16	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
45	FCPADS	FUEL-CL-PH	POWR	154.	5.	13.	2.	5.	2.	154.	0.	167.	DISTILLA	167.	0	0.16	0.03	0.80
45	FCPADS	FUEL-CL-PH	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77
46	FCMCDS	FUEL-CL-MO	POWR	153.	7.	12.	3.	5.	2.	153.	0.	165.	DISTILLA	165.	10	0.22	0.03	0.80
46	FCMCDS	FUEL-CL-MO	HEAT	156.	0.	0.	0.	0.	0.	156.	16.	156.	DISTILLA	172.	110	-0.00	0.	0.77

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28692 MW 5.70 PROCESS MILLIONS BTU/HR 150.0 PROCESS TEMP(F) 598. PRODUCT ETHYLENE-FRO HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.130

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	176.	61.	176.	COAL-FGD	237.	0	0.	0.08	0.63
1 STM141 STM-TURB-1 POWR	0.	38.	-3533.	-3023.	19.	6.	3733.	0.	199.	RESIDUAL	199.	11	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	-2.	175.	150.	-1.	-0.	0.	64.	175.	RESIDUAL	239.	11	-0.01	-0.00	0.63
1 STM141 STM-TURB-1 POWR	0.	38.	-3533.	-3023.	19.	6.	3733.	0.	199.	COAL-FGD	199.	11	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	-2.	175.	150.	-1.	-0.	0.	64.	175.	COAL-FGD	239.	11	-0.01	-0.00	0.63
1 STM141 STM-TURB-1 POWR	0.	38.	-3533.	-3023.	19.	6.	3733.	0.	199.	COAL-AFB	199.	11	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	-2.	175.	150.	-1.	-0.	0.	64.	175.	COAL-AFB	239.	11	-0.01	-0.00	0.63
2 STM088 STM-TURB-8 POWR	0.	38.	-438.	-392.	19.	6.	638.	0.	199.	RESIDUAL	199.	1	0.16	0.10	0.75
2 STM088 STM-TURB-8 HEAT	0.	-15.	168.	150.	-7.	-2.	0.	84.	168.	RESIDUAL	252.	11	-0.06	-0.03	0.60
2 STM088 STM-TURB-8 POWR	0.	38.	-438.	-392.	19.	6.	638.	0.	199.	COAL-FGD	199.	1	0.16	0.10	0.75
2 STM088 STM-TURB-8 HEAT	0.	-15.	168.	150.	-7.	-2.	0.	84.	168.	COAL-FGD	252.	11	-0.06	-0.03	0.60
2 STM088 STM-TURB-8 POWR	0.	38.	-438.	-392.	19.	6.	638.	0.	199.	COAL-AFB	199.	1	0.16	0.10	0.75
2 STM088 STM-TURB-8 HEAT	0.	-15.	168.	150.	-7.	-2.	0.	84.	168.	COAL-AFB	252.	11	-0.06	-0.03	0.60
3 PFBSTM PFB-STMTB- POWR	0.	-2.	239.	180.	19.	6.	-35.	0.	239.	COAL-PFB	239.	10	-0.01	0.08	0.63
3 PFBSTM PFB-STMTB- HEAT	0.	27.	200.	150.	16.	5.	0.	10.	200.	COAL-PFB	210.	10	0.12	0.08	0.72
4 TISTMT TI-STMTB-1 POWR	0.	37.	146.	103.	19.	6.	55.	0.	201.	RESIDUAL	201.	11	0.15	0.10	0.75
4 TISTMT TI-STMTB-1 HEAT	0.	53.	211.	150.	28.	8.	0.	-27.	211.	RESIDUAL	184.	11	0.20	0.13	0.71
4 TISTMT TI-STMTB-1 POWR	0.	37.	146.	103.	19.	6.	55.	0.	201.	COAL	201.	11	0.15	0.10	0.75
4 TISTMT TI-STMTB-1 HEAT	0.	53.	211.	150.	28.	8.	0.	-27.	211.	COAL	184.	11	0.20	0.13	0.71
5 TIHRSG THERMIONIC POWR	0.	11.	138.	75.	19.	6.	88.	0.	226.	RESIDUAL	226.	0	0.05	0.09	0.66
5 TIHRSG THERMIONIC HEAT	0.	22.	276.	150.	39.	11.	0.	-61.	276.	RESIDUAL	215.	0	0.07	0.14	0.54
5 TIHRSG THERMIONIC POWR	0.	11.	138.	75.	19.	6.	88.	0.	226.	COAL	226.	0	0.05	0.09	0.66
5 TIHRSG THERMIONIC HEAT	0.	22.	276.	150.	39.	11.	0.	-61.	276.	COAL	215.	0	0.07	0.14	0.54
6 STIRL STIRLING-1 POWR	0.	23.	106.	57.	19.	6.	109.	0.	215.	DISTILLA	215.	1	0.10	0.09	0.70
6 STIRL STIRLING-1 HEAT	0.	59.	276.	150.	51.	15.	0.	-98.	276.	DISTILLA	178.	1	0.18	0.18	0.54

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28692 MW 5.70 PROCESS MILLIONS BTU/HR 150.0 PROCESS TEMP(F) 598. PRODUCT ETHYLENE-FRO HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.130

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	23.	106.	57.	19.	6.	109.	0.	215.	RESIDUAL	215.	1	0.10	0.09	0.70
6 STIRL	STIRLING-1	HEAT	0.	59.	276.	150.	51.	15.	0.	-98.	276.	RESIDUAL	178.	1	0.18	0.18	0.54
6 STIRL	STIRLING-1	POWR	0.	23.	106.	57.	19.	6.	109.	0.	215.	COAL	215.	1	0.10	0.09	0.70
6 STIRL	STIRLING-1	HEAT	0.	59.	276.	150.	51.	15.	0.	-98.	276.	COAL	178.	1	0.18	0.18	0.54
7 HEGT85	HELIUM-GT-	POWR	0.	-23.	61.	-20.	19.	6.	200.	0.	260.	COAL-AFB	260.	11	-0.10	0.07	0.58
7 HEGT85	HELIUM-GT-	HEAT	-459.	175.	-459.	150.	-147.	-43.	0.	522.	-459.	COAL-AFB	62.	11	-1.20	-2.37	2.41
8 HEGT60	HELIUM-GT-	POWR	0.	-16.	75.	-1.	19.	6.	178.	0.	253.	COAL-AFB	253.	11	-0.07	0.08	0.59
8 HEGT60	HELIUM-GT-	HEAT	-10757.	2227.	-10757.	150.	-2786.	-817.	0.	8767.	-10757.	COAL-AFB	-1990.	11	*****	1.40	-0.08
9 HEGT00	HELIUM-GT-	POWR	0.	8.	111.	49.	19.	6.	118.	0.	229.	COAL-AFB	229.	10	0.04	0.08	0.66
9 HEGT00	HELIUM-GT-	HEAT	0.	25.	336.	150.	59.	17.	0.	-124.	336.	COAL-AFB	212.	10	0.07	0.18	0.45
10 FCMCCL	FUEL-CL-MO	POWR	0.	32.	64.	30.	19.	6.	141.	0.	205.	COAL	205.	10	0.13	0.09	0.73
10 FCMCCL	FUEL-CL-MO	HEAT	0.	160.	321	150.	98.	29.	0.	-244.	321.	COAL	77.	10	0.33	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	33.	64.	30.	19.	6.	141.	0.	205.	COAL	205.	11	0.14	0.10	0.73
11 FCSTCL	FUEL-CL-ST	HEAT	0.	160.	315.	150.	96.	28.	0.	-238.	315.	COAL	77.	11	0.34	0.30	0.48
12 IGGTST	INT-GAS-GT	POWR	0.	22.	99.	51.	19.	6.	117.	0.	216.	COAL	216.	11	0.09	0.09	0.70
12 IGGTST	INT-GAS-GT	HEAT	0.	64.	292.	150.	57.	17.	0.	-118.	292.	COAL	174.	11	0.18	0.20	0.51
13 GTSOAR	GT-HRSG-10	POWR	0.	20.	67.	23.	19.	6.	150.	0.	217.	RESIDUAL	217.	10	0.09	0.09	0.69
13 GTSOAR	GT-HRSG-10	HEAT	0.	135.	444.	150.	129.	38.	0.	-341.	444.	RESIDUAL	102.	0	0.23	0.29	0.34
14 GTAC08	GT-HRSG-08	POWR	0.	32.	72.	37.	19.	6.	133.	0.	205.	RESIDUAL	205.	10	0.14	0.09	0.73
14 GTAC08	GT-HRSG-08	HEAT	0.	131.	293.	150.	79.	23.	0.	-186.	293.	RESIDUAL	107.	0	0.31	0.27	0.51
15 GTAC12	GT-HRSG-12	POWR	0.	32.	64.	30.	19.	6.	141.	0.	205.	RESIDUAL	205.	10	0.14	0.09	0.73
15 GTAC12	GT-HRSG-12	HEAT	0.	162.	319.	150.	97.	29.	0.	-243.	319.	RESIDUAL	76.	0	0.34	0.31	0.47
16 GTAC16	GT-HRSG-16	POWR	0.	30.	60.	25.	19.	6.	147.	0.	207.	RESIDUAL	207.	10	0.13	0.09	0.72
16 GTAC16	GT-HRSG-16	HEAT	0.	180.	361.	150.	117.	34.	0.	-304.	361.	RESIDUAL	57.	0	0.33	0.32	0.42
17 GTWC16	GT-HRSG-16	POWR	0.	29.	62.	25.	19.	6.	147.	0.	209.	RESIDUAL	209.	10	0.12	0.09	0.72
17 GTWC16	GT-HRSG-16	HEAT	0.	171.	369.	150.	116.	34.	0.	-303.	369.	RESIDUAL	67.	0	0.32	0.32	0.41

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28692 MW 5.70 PROCESS MILLIONS BTU/HR 150.0 PROCESS TEMP(F) 598. PRODUCT ETHYLENE-FRO HOURS PER YEAR 7900

POWER TO HEAT RATIO 0.130

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626	GTST-16/26	POWR	0.	26.	62.	23.	19.	6.	149.	0.	211.	RESIDUAL	211.	11	0.11	0.09	0.71
18 CC1626	GTST-16/26	HEAT	0.	168.	400.	150.	125.	37.	0.	-331.	400.	RESIDUAL	70.	1	0.30	0.31	0.37
19 CC1622	GTST-16/22	POWR	0.	27.	64.	26.	19.	6.	146.	0.	210.	RESIDUAL	210.	11	0.12	0.09	0.72
19 CC1622	GTST-16/22	HEAT	0.	157.	366.	150.	111.	33.	0.	-286.	366.	RESIDUAL	80.	1	0.30	0.30	0.41
20 CC1222	GTST-12/22	POWR	0.	28.	64.	27.	19.	6.	145.	0.	209.	RESIDUAL	209.	11	0.12	0.09	0.72
20 CC1222	GTST-12/22	HEAT	0.	156.	362.	150.	109.	32.	0	-281.	362.	RESIDUAL	81.	1	0.30	0.30	0.41
21 CC0822	GTST-08/22	POWR	0.	30.	73.	36.	19.	6.	134.	0.	207.	RESIDUAL	207.	11	0.13	0.09	0.72
21 CC0822	GTST-08/22	HEAT	0.	126.	306.	150.	82.	24.	0.	-194.	306.	RESIDUAL	112.	1	0.29	0.27	0.49
22 STIG15	STIG-15-16	POWR	0.	11.	51.	1.	19.	6.	176.	0.	227.	RESIDUAL	227.	11	0.04	0.09	0.66
22 STIG15	STIG-15-16	HEAT	0.	2376.	11538.	150.	4396.	1288.	0.	-13677.	11538.	RESIDUAL	-2139.	1	0.17	0.38	0.01
23 STIG10	STIG-10-16	POWR	0.	15.	54.	7.	19	6.	168.	0.	222.	RESIDUAL	222.	11	0.06	0.09	0.66
23 STIG10	STIG-10-16	HEAT	0.	315.	1132.	150.	407.	119.	0.	-1210.	1132.	RESIDUAL	-78.	1	0.22	0.36	0.13
24 STIG1S	STIG-1S-16	POWR	0.	17.	58.	12.	19.	6.	162.	0.	220.	RESIDUAL	220.	11	0.07	0.09	0.68
24 STIG1S	STIG-1S-16	HEAT	0.	210.	712.	150.	239.	70.	0.	-685.	712.	RESIDUAL	27.	1	0.23	0.34	0.21
25 DEADV3	DIESEL-ADV	POWR	0.	15.	52.	6.	19.	6.	170.	0.	222.	RESIDUAL	222.	1	0.06	0.09	0.67
25 DEADV3	DIESEL-ADV	HEAT	0.	400.	1404.	150.	521.	153.	0	-1567.	1404.	RESIDUAL	-163.	1	0.22	0.37	0.11
26 DEADV2	DIESEL-ADV	POWR	0.	24.	52.	13.	19.	6.	161.	0.	213.	RESIDUAL	213.	1	0.10	0.09	0.70
26 DEADV2	DIESEL-ADV	HEAT	0.	271.	591.	150.	219.	64.	0.	-624.	591.	RESIDUAL	-33.	1	0.31	0.37	0.25
27 DEADV1	DIESEL-ADV	POWR	0.	32.	52.	20.	19.	6.	152.	0.	205.	RESIDUAL	205.	1	0.14	0.09	0.73
27 DEADV1	DIESEL-ADV	HEAT	0.	238.	384.	150.	142.	42.	0.	-384.	384.	RESIDUAL	-0.	1	0.38	0.37	0.39
28 DEHTPM	ADV-DIESEL	POWR	0.	17.	92.	41.	19.	6.	128.	0.	220.	RESIDUAL	220.	1	0.07	0.09	0.68
28 DEHTPM	ADV-DIESEL	HEAT	0.	62.	336.	150.	71.	21.	0.	-160.	336.	RESIDUAL	176.	1	0.16	0.21	0.45
29 DESOA3	DIESEL-SOA	POWR	0.	12.	54.	4.	19.	6.	172.	0.	226.	DISTILLA	226.	1	0.05	0.09	0.66
29 DESOA3	DIESEL-SOA	HEAT	0.	440.	2059.	150.	743.	218.	0.	-2262.	2059.	DISTILLA	-203.	1	0.18	0.36	0.07
29 DESOA3	DIESEL-SOA	POWR	0.	12.	54.	4.	19.	6.	172.	0.	226.	RESIDUAL	226.	1	0.05	0.09	0.66
29 DESOA3	DIESEL-SOA	HEAT	0.	440.	2059.	150.	743.	218.	0.	-2262.	2059.	RESIDUAL	-203.	1	0.18	0.36	0.07

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28692 MW 5.70 PROCESS MILLIONS BTU/HR 150.0 PROCESS TEMP(F) 598. PRODUCT ETHYLENE-FRO HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.130

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	21.	54.	12.	19.	6.	163.	0.	216.	DISTILLA	216.	1	0.09	0.09	0.69
30	DESOA2	DIESEL-SOA	HEAT	0.	264.	682.	150.	246.	72.	0.	-708.	682.	DISTILLA	-27.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	21.	54.	12.	19.	6.	163.	0.	216.	RESIDUAL	216.	1	0.09	0.09	0.69
30	DESOA2	DIESEL-SOA	HEAT	0.	264.	682.	150.	246.	72.	0.	-708.	682.	RESIDUAL	-27.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	32.	54.	22.	19.	6.	151.	0.	205.	DISTILLA	205.	1	0.14	0.09	0.73
31	DESOA1	DIESEL-SOA	HEAT	0.	224.	374.	150.	135.	40.	0.	-361.	374.	DISTILLA	13.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	32.	54.	22.	19.	6.	151.	0.	205.	RESIDUAL	205.	1	0.14	0.09	0.73
31	DESOA1	DIESEL-SOA	HEAT	0.	224.	374.	150.	135.	40.	0.	-361.	374.	RESIDUAL	13.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	30.	67.	30.	19.	6.	141.	0.	207.	DISTILLA	207.	10	0.13	0.09	0.72
32	GTSOAD	GT-HRSG-10	HEAT	0.	148.	330.	150.	96.	28.	0.	-240.	330.	DISTILLA	90.	0	0.31	0.29	0.45
33	GTRA08	GT-85RE-08	POWR	0.	19.	54.	11.	19.	6.	163.	0.	218.	DISTILLA	218.	10	0.08	0.09	0.69
33	GTRA08	GT-85RE-08	HEAT	0.	262.	741.	150.	264.	78.	0.	-786.	741.	DISTILLA	-25.	0	0.26	0.36	0.20
34	GTRA12	GT-85RE-12	POWR	0.	22.	54.	13.	19.	6.	161.	0.	216.	DISTILLA	216.	10	0.09	0.09	0.70
34	GTRA12	GT-85RE-12	HEAT	0.	252.	635.	150.	227.	67.	0.	-650.	635.	DISTILLA	-15.	0	0.28	0.36	0.24
35	GTRA16	GT-85RE-16	POWR	0.	23.	56.	15.	19.	6.	159.	0.	215.	DISTILLA	215.	10	0.10	0.09	0.70
35	GTRA16	GT-85RE-16	HEAT	0.	227.	556.	150.	194.	57.	0.	-546.	556.	DISTILLA	10.	0	0.29	0.35	0.27
36	GTR208	GT-60RE-08	POWR	0.	24.	61.	21.	19.	6.	152.	0.	213.	DISTILLA	213.	10	0.10	0.09	0.70
36	GTR208	GT-60RE-08	HEAT	0.	176.	444.	150.	142.	42.	0.	-383.	444.	DISTILLA	61.	0	0.28	0.32	0.34
37	GTR212	GT-60RE-12	POWR	0.	24.	59.	19.	19.	6.	154.	0.	213.	DISTILLA	213.	10	0.10	0.09	0.70
37	GTR212	GT-60RE-12	HEAT	0.	191.	465.	150.	153.	45.	0.	-418.	465.	DISTILLA	46.	0	0.29	0.33	0.32
38	GTR216	GT-60RE-16	POWR	0.	25.	58.	18.	19.	6.	155.	0.	213.	DISTILLA	213.	10	0.10	0.09	0.71
38	GTR216	GT-60RE-16	HEAT	0.	202.	474.	150.	160.	47.	0.	-438.	474.	DISTILLA	36.	0	0.30	0.34	0.32
39	GTRW08	GT-85RE-08	POWR	0.	17.	55.	10.	19.	6.	165.	0.	220.	DISTILLA	220.	10	0.07	0.09	0.68
39	GTRW08	GT-85RE-08	HEAT	0.	257.	834.	150.	293.	86.	0.	-854.	834.	DISTILLA	-20.	0	0.24	0.35	0.18
40	GTRW12	GT-85RE-12	POWR	0.	20.	53.	11.	19.	6.	164.	0.	217.	DISTILLA	217.	10	0.09	0.09	0.69
40	GTRW12	GT-85RE-12	HEAT	0.	277.	732.	150.	267.	78.	0.	-772.	732.	DISTILLA	-40.	0	0.27	0.36	0.20

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28692 MW 5.70 PROCESS MILLIONS BTU/HR 150.0 PROCESS TEMP(F) 598. PRODUCT ETHYLENE-FRO HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.130

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	22.	54.	13.	19.	6.	161.	0.	216.	DISTILLA	216.	10	0.09	0.09	0.70
41 GTRW16 GT-85RE-16 HEAT	0.	249.	628.	150.	224.	66.	0.	-640.	628.	DISTILLA	-12.	0	0.28	0.36	0.24
42 GTR308 GT-60RE-08 POWR	0.	16.	63.	15.	19.	6.	159.	0.	221.	DISTILLA	221.	10	0.07	0.09	0.68
42 GTR308 GT-60RE-08 HEAT	0.	157.	621.	150.	193.	56.	0.	-541.	621.	DISTILLA	80.	0	0.20	0.31	0.24
43 GTR312 GT-60RE-12 POWR	0.	24.	57.	17.	19.	6.	156.	0.	213.	DISTILLA	213.	10	0.10	0.09	0.70
43 GTR312 GT-60RE-12 HEAT	0.	211.	498.	150.	170.	50.	0.	-471.	498	DISTILLA	27.	0	0.30	0.34	0.30
44 GTR316 GT-60RE-16 POWR	0.	24.	57.	18.	19.	6.	156.	0.	213.	DISTILLA	213.	10	0.10	0.09	0.70
44 GTR316 GT-60RE-16 HEAT	0.	206.	491.	150.	166.	49.	0.	-459.	491.	DISTILLA	32.	0	0.30	0.34	0.31
45 FCPADS FUEL-CL-PH POWR	0.	20.	51.	9.	19.	6.	166.	0.	217.	DISTILLA	217.	0	0.08	0.09	0.69
45 FCPADS FUEL-CL-PH HEAT	0.	342.	882.	150.	335.	98.	0.	-987.	882.	DISTILLA	-105.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	27.	47.	11.	19.	6.	164.	0.	211.	DISTILLA	211.	0	0.11	0.09	0.71
46 FCMCDS FUEL-CL-MO HEAT	0.	362.	644.	150.	265.	78.	0.	-768.	644.	DISTILLA	-124.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28693 MW 3.60 PROCESS MILLIONS BTU/HR 350.0 PROCESS TEMP(F) 366. PRODUCT ISOPROPANOL- HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.035

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN	N O C O G O N		41.	0.	0.	0.	0.	0.	412.	38.	412.	COAL-FGD	450.	0	0.	0.03	0.78
1 STM141	STM-TURB-1	POWR	41.	24.	94.	68.	12.	4.	332.	0.	426.	RESIDUAL	426.	10	0.06	0.03	0.82
1 STM141	STM-TURB-1	HEAT	41.	124.	486.	350.	63.	19.	0.	-160.	486.	RESIDUAL	326.	0	0.22	0.13	0.72
1 STM141	STM-TURB-1	POWR	41.	24.	94.	68.	12.	4.	332.	0.	426.	COAL-FGD	426.	10	0.06	0.03	0.82
1 STM141	STM-TURB-1	HEAT	41.	124.	486.	350.	63.	19.	0.	-160.	486.	COAL-FGD	326.	0	0.22	0.13	0. 2
1 STM141	STM-TURB-1	POWR	41.	24.	94.	68.	12.	4.	332.	0.	426.	COAL-AFB	426.	10	0.06	0.03	0.82
1 STM141	STM-TURB-1	HEAT	41.	124.	486.	350.	63.	19.	0.	-160.	486.	COAL-AFB	326.	0	0.22	0.13	0.72
2 STM088	STM-TURB-8	POWR	41.	24.	129.	97.	12.	4.	298.	0.	426.	RESIDUAL	426.	10	0.06	0.03	0.82
2 STM088	STM-TURB-8	HEAT	41.	86.	464.	350.	44.	13.	0.	-100.	464.	RESIDUAL	364.	0	0.17	0.10	0.75
2 STM088	STM-TURB-8	POWR	41.	24.	129.	97.	12.	4.	298.	0.	426.	COAL-FGD	426.	10	0.06	0.03	0.82
2 STM088	STM-TURB-8	HEAT	41.	86.	464.	350.	44.	13.	0.	-100.	464.	COAL-FGD	364.	0	0.17	0.10	0.75
2 STM088	STM-TURB-8	POWR	41.	24.	129.	97.	12.	4.	298.	0.	426.	COAL-AFB	426.	10	0.06	0.03	0.82
2 STM088	STM-TURB-8	HEAT	41.	86.	464.	350.	44.	13.	0.	-100.	464.	COAL-AFB	364.	0	0.17	0.10	0.75
3 PFBSTM	PFB-STMTB-	POWR	41.	23.	62.	40.	12.	4.	365.	0.	427.	COAL-PFB	427.	10	0.06	0.03	0.82
3 PFBSTM	PFB-STMTB-	HEAT	41.	205.	544.	350.	108.	32.	0.	-299.	544.	COAL-PFB	245.	0	0.29	0.20	0.64
4 TISTMT	TI-STMTB-1	POWR	41.	24.	49.	29.	12.	4.	377.	0.	427.	RESIDUAL	427.	10	0.06	0.03	0.82
4 TISTMT	TI-STMTB-1	HEAT	41.	252.	530.	315.	131.	39.	41.	-373.	571.	RESIDUAL	198.	0	0.32	0.23	0.61
4 TISTMT	TI-STMTB-1	POWR	41.	24.	49.	29.	12.	4.	377.	0.	427.	COAL	427.	10	0.06	0.03	0.82
4 TISTMT	TI-STMTB-1	HEAT	41.	280.	588.	350.	146.	43.	0.	-418.	588.	COAL	170.	0	0.34	0.25	0.59
5 TIHRSG	THERMIONIC	POWR	41.	17.	87.	56.	12.	4.	345.	0.	433.	RESIDUAL	433.	0	0.04	0.03	0.81
5 TIHRSG	THERMIONIC	HEAT	41.	97.	488.	315.	69.	20.	41.	-176.	529.	RESIDUAL	353.	0	0.17	0.13	0.66
5 TIHRSG	THERMIONIC	POWR	41.	17.	87.	56.	12.	4.	345.	0.	433.	COAL	433.	0	0.04	0.03	0.81
5 TIHRSG	THERMIONIC	HEAT	41.	108.	542.	350.	76.	22.	0.	-200.	542.	COAL	342.	0	0.18	0.14	0.65
6 STIRL	STIRLING-1	POWR	41.	17.	49.	23.	12.	4.	384.	0.	433.	DISTILLA	433.	0	0.04	0.0[illegible]	0.81
6 STIRL	STIRLING-1	HEAT	41.	230.	660.	315.	166.	49.	41.	-481.	701.	DISTILLA	220.	0	0.26	0.2[illegible]	0.50

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28693 MW 3.60 PROCESS MILLIONS BTU/HR 350.0 PROCESS TEMP(F) 366. PRODUCT ISOPROPANOL- HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.035

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	41	17.	49.	23.	12.	4.	384.	0.	433.	RESIDUAL	433.	0	0.04	0.03	0.81
6	STIRL	STIRLING-1	HEAT	41.	230.	660.	315.	166.	49.	41.	-481.	701.	RESIDUAL	220.	0	0.26	0.24	0.50
6	STIRL	STIRLING-1	POWR	41.	17.	49.	23.	12.	4.	384.	0.	433.	COAL	433.	0	0.04	0.03	0.81
6	STIRL	STIRLING-1	HEAT	41.	256.	734.	350.	185.	54.	0	-539.	734.	COAL	194.	0	0.27	0.25	0.48
7	HEGT85	HELIUM-GT-	POWR	41.	5.	38.	5.	12.	4.	406.	0.	445.	COAL-AFB	445.	10	0.01	0.03	0.79
7	HEGT85	HELIUM-GT-	HEAT	41.	421.	2960.	350.	950.	279.	0.	-2931.	2960.	COAL-AFB	29.	0	0.13	0.32	0.12
8	HEGT60	HELIUM-GT-	POWR	41.	7.	47.	14.	12.	4.	396.	0.	443.	COAL-AFB	443.	10	0.02	0.03	0.79
8	HEGT60	HELIUM-GT-	HEAT	41.	182.	1204.	350.	312.	91.	0.	-936.	1204.	COAL-AFB	268.	0	0.14	0.26	0.29
9	HEGT00	HELIUM-GT-	POWR	41.	9.	70.	34.	12.	4.	372.	0.	441.	COAL-AFB	441.	10	0.02	0.03	0.79
9	HEGT00	HELIUM-GT-	HEAT	41.	89.	717.	350.	126.	37.	0.	-356.	717.	COAL-AFB	361.	10	0.12	0.18	0.49
10	FCMCCL	FUEL-CL-MO	POWR	0.	20.	40.	19.	12.	4.	389.	0.	430.	COAL	430.	10	-0.05	0.03	0.81
10	FCMCCL	FUEL-CL-MO	HEAT	0.	375.	739.	350.	225	66.	0.	-664.	739.	COAL	75.	10	0.31	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	21.	33.	13.	12.	4.	396.	0.	429.	COAL	429.	10	-0.05	0.03	0.82
11	FCSTCL	FUEL-CL-ST	HEAT	0.	565.	869.	350.	327.	96.	0.	-985.	869.	COAL	-115.	10	0.38	0.38	0.40
12	IGGTST	INT-GAS-GT	POWR	0.	17.	44.	19.	12.	4.	389.	0.	433.	COAL	433.	10	-0.06	0.03	0.81
12	IGGTST	INT-GAS-GT	HEAT	0.	305.	810.	350.	225.	66.	0.	-665.	810.	COAL	145.	10	0.25	0.28	0.43
13	GTSOAR	GT-HRSG-10	POWR	41.	17.	42.	18.	12.	4.	391.	0.	433.	RESIDUAL	433.	10	0. 4	0.03	0.81
13	GTSOAR	GT-HRSG-10	HEAT	41.	301.	743.	315.	215.	63.	41.	-635.	784.	RESIDUAL	149.	0	0.29	0.27	0.45
14	GTAC08	GT-HRSG-08	POWR	41.	20.	45.	23.	12.	4.	384.	0.	430.	RESIDUAL	430.	10	0.05	0.03	0.81
14	GTAC08	GT-HRSG-08	HEAT	41.	275.	612.	315.	165.	48.	41.	-478.	653.	RESIDUAL	175.	0	0.31	0.25	0.54
15	GTAC12	GT-HRSG-12	POWR	41.	20.	40.	19.	12.	4.	390.	0.	430.	RESIDUAL	430.	10	0.05	0.03	0.81
15	GTAC12	GT-HRSG-12	HEAT	41.	339.	679.	315.	207.	61.	41.	-608.	720.	RESIDUAL	111.	0	0.33	0.29	0.49
16	GTAC16	GT-HRSG-16	POWR	41.	20.	38.	16.	12.	4.	392.	0.	430.	RESIDUAL	430.	10	0.05	0.03	0.81
16	GTAC16	GT-HRSG-16	HEAT	41.	377.	728.	315.	235.	69.	41.	-697.	770.	RESIDUAL	73.	0	0.34	0.31	0.45
17	GTWC16	GT-HRSG-16	POWR	41.	18.	39.	16.	12.	4.	393.	0.	432.	RESIDUAL	432.	10	0.04	0.03	0.81
17	GTWC16	GT-HRSG-16	HEAT	41.	358.	778.	315.	245.	72.	41.	-728.	820.	RESIDUAL	92.	0	0.32	0.30	0.43

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28693 MW 3.60 PROCESS MILLIONS BTU/HR 350.0 PROCESS TEMP(F) 366. PRODUCT ISOPROPANOL- HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.035

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	41.	18.	33.	10.	12.	4.	400.	0.	433.	RESIDUAL	433.	10	0.04	0.03	0.81
18 CC1626 GTST-16/26 HEAT	41.	534.	1000.	315.	372.	109.	41.	-1125.	1041.	RESIDUAL	-84.	0	0.35	0.36	0.34
19 CC1622 GTST-16/22 POWR	41.	19.	33.	12.	12.	4.	398.	0.	432.	RESIDUAL	432.	10	0.05	0.03	0.81
19 CC1622 GTST-16/22 HEAT	41.	504.	912.	315.	335.	98.	41.	-1007.	953.	RESIDUAL	-54.	0	0.36	0.35	0.37
20 CC1222 GTST-12/22 POWR	41.	19.	33.	12.	12.	4.	398.	0.	431.	RESIDUAL	431.	10	0.05	0.03	0.81
20 CC1222 GTST-12/22 HEAT	41.	506.	904.	315.	333.	97.	41.	-1001.	945.	RESIDUAL	-56.	0	0.36	0.35	0.37
21 CC0822 GTST-08/22 POWR	41.	20.	36.	15.	12.	4.	394.	0.	430.	RESIDUAL	430.	10	0.05	0.03	0.81
21 CC0822 GTST-08/22 HEAT	41.	429.	764.	315.	263.	77.	41.	-784.	805.	RESIDUAL	21.	0	0.36	0.33	0.43
22 STIG15 STIG-15-16 POWR	41.	7.	32.	0.	12.	4.	411.	0.	444.	RESIDUAL	444.	10	0.02	0.03	0.79
22 STIG15 STIG-15-16 HEAT	41.	4990.	24231.	315.	9232.	2706.	41.	-28811.	24272.	RESIDUAL	-4539.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	41.	10.	34.	5.	12.	4.	406.	0.	441.	RESIDUAL	441.	10	0.02	0.03	0.79
23 STIG10 STIG-10-16 HEAT	41.	661.	2377.	315.	854.	250.	41.	-2629.	2419.	RESIDUAL	-211.	0	0.22	0.35	0.14
24 STIG1S STIG-1S-16 POWR	41.	11.	37.	8.	12.	4.	403.	0.	439.	RESIDUAL	439.	10	0.03	0.03	0.80
24 STIG1S STIG-1S-16 HEAT	41.	442.	1494.	315.	501.	147.	41.	-1527.	1535.	RESIDUAL	9.	0	0.23	0.33	0.23
25 DEADV3 DIESEL-ADV POWR	41.	13.	33.	7.	12.	4.	404.	0.	437.	RESIDUAL	437.	0	0.03	0.03	0.80
25 DEADV3 DIESEL-ADV HEAT	41.	616.	1537.	315.	570.	167.	41.	-1743.	1578.	RESIDUAL	-165.	0	0.29	0.36	0.22
26 DEADV2 DIESEL-ADV POWR	41.	15.	33.	8.	12.	4.	402.	0.	435.	RESIDUAL	435.	1	0.04	0.03	0.80
26 DEADV2 DIESEL-ADV HEAT	41.	568.	1240.	315.	460.	135.	41.	-1399.	1281.	RESIDUAL	-118.	1	0.31	0.36	0.27
27 DEADV1 DIESEL-ADV POWR	41.	21.	33.	13.	12.	4.	397.	0.	430.	RESIDUAL	430.	1	0.05	0.03	0.81
27 DEADV1 DIESEL-ADV HEAT	41.	499.	806.	315.	299.	88.	41.	-896.	847.	RESIDUAL	-49.	1	0.38	0.35	0.41
28 DEHTPM ADV-DIESEL POWR	41.	20.	38.	16.	12.	4.	393.	0.	430.	RESIDUAL	430.	0	0.05	0.03	0.81
28 DEHTPM ADV-DIESEL HEAT	41.	387.	735.	315.	240.	70.	41.	-713.	776.	RESIDUAL	63.	0	0.34	0.31	0.45
29 DESOA3 DIESEL-SOA POWR	41.	11.	34.	6.	12.	4.	405.	0.	439.	DISTILLA	439.	0	0.03	0.03	0.80
29 DESOA3 DIESEL-SOA HEAT	41.	607.	1842.	315.	665.	195.	41.	-2040.	1883.	DISTILLA	-156.	0	0.25	0.35	0.19
29 DESOA3 DIESEL-SOA POWR	41.	11.	34.	6.	12.	4.	405.	0.	439.	RESIDUAL	439.	0	0.03	0.03	0.80
29 DESOA3 DIESEL-SOA HEAT	41.	607.	1842.	315.	665.	195.	41.	-2040.	1883.	RESIDUAL	-156.	0	0.25	0.35	0.19

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PFO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28693 MW 3.60 PROCESS MILLIONS BTU/HR 350.0 PROCESS TEMP(F) 366. PRODUCT ISOPROPANOL- HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.035

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	41.	13.	34.	7.	12.	4.	403.	0.	437.	DISTILLA	437.	1	0.03	0.03	0.80
30 DESOA2 DIESEL-SOA HEAT	41.	554.	1432.	315.	517.	151.	41.	-1577.	1473.	DISTILLA	-104.	1	0.28	0.35	0.24
30 DESOA2 DIESEL-SOA POWR	41.	13.	34.	7.	12.	4.	403.	0.	437.	RESIDUAL	437.	1	0.03	0.03	0.80
30 DESOA2 DIESEL-SOA HEAT	41.	554.	1432.	315.	517.	151.	41.	-1577.	1473.	RESIDUAL	-104.	1	0.28	0.35	0.24
31 DESOA1 DIESEL-SOA POWR	41.	20.	34.	14.	12.	4.	396.	0.	430.	DISTILLA	430.	1	0.05	0.03	0.81
31 DESOA1 DIESEL-SOA HEAT	41.	471.	786.	315.	284.	83.	41.	-848.	827.	DISTILLA	-21	1	0.37	0.34	0.42
31 DESOA1 DIESEL-SOA POWR	41.	20.	34.	14.	12.	4.	396.	0.	430.	RESIDUAL	430.	1	0.05	0.03	0.81
31 DESOA1 DIESEL-SOA HEAT	41.	471.	786.	315.	284.	83.	41.	-848.	827.	RESIDUAL	-21.	1	0.37	0.34	0.42
32 GTSOAD GT-HRSG-10 POWR	41.	19.	42.	19.	12.	4.	389.	0.	431.	DISTILLA	431.	10	0.05	0.03	0.81
32 GTSOAD GT-HRSG-10 HEAT	41.	311.	684.	315.	200.	59.	41.	-586.	725.	DISTILLA	139.	0	0.31	0.28	0.48
33 GTRA08 GT-85RE-08 POWR	41.	18.	34.	12.	12.	4.	398.	0.	433.	DISTILLA	433.	10	0.04	0.03	0.81
33 GTRA08 GT-85RE-08 HEAT	41.	479.	937.	315.	334.	98.	41.	-1007.	978.	DISTILLA	-29.	0	0.34	0.34	0.36
34 GTRA12 GT-85RE-12 POWR	41.	18.	34.	12.	12.	4.	398.	0.	432.	DISTILLA	432.	10	0.04	0.03	0.81
34 GTRA12 GT-85RE-12 HEAT	41.	479.	910.	315.	326.	95.	41.	-980.	951.	DISTILLA	-28.	0	0.34	0.34	0.37
35 GTRA16 GT-85RE-16 POWR	41.	18.	35.	13.	12.	4.	397.	0.	432.	DISTILLA	432.	10	0.04	0.03	0.81
35 GTRA16 GT-85RE-16 HEAT	41.	449.	869.	315.	303.	89.	41.	-910.	910.	DISTILLA	1.	0	0.34	0.33	0.38
36 GTR208 GT-60RE-08 POWR	41.	18.	38.	15.	12.	4.	394.	0.	432.	DISTILLA	432.	10	0.04	0.03	0.81
36 GTR208 GT-60RE-08 HEAT	41.	371.	783.	315.	251.	73.	41.	-745.	825.	DISTILLA	80.	0	0.32	0.30	0.42
37 GTR212 GT-60RE-12 POWR	41.	18.	37.	14.	12.	4.	395.	0.	432.	DISTILLA	432.	10	0.04	0.03	0.81
37 GTR212 GT-60RE-12 HEAT	41.	396.	815.	315.	269.	79.	41.	-802.	856.	DISTILLA	54.	0	0.33	0.31	0.41
38 GTR216 GT-60RE-16 POWR	41.	18.	36.	14.	12.	4.	395.	0.	432.	DISTILLA	432.	10	0.05	0.03	0.81
38 GTR216 GT-60RE-16 HEAT	41.	414.	818.	315.	276.	81.	41.	-823.	859.	DISTILLA	36.	0	0.34	0.32	0.41
39 GTRW08 GT-85RE-08 POWR	41.	15.	35.	10.	12.	4.	400.	0.	435.	DISTILLA	435.	10	0.04	0.03	0.80
39 GTRW08 GT-85RE-08 HEAT	41.	481.	1136.	315.	399.	117.	41.	-1207.	1177.	DISTILLA	-30.	0	0.30	0.34	0.30
40 GTRW12 GT-85RE-12 POWR	41.	16.	34.	10.	12.	4.	401.	0.	434.	DISTILLA	434.	10	0.04	0.03	0.81
40 GTRW12 GT-85RE-12 HEAT	41.	523.	1111.	315	404.	119.	41.	-1226.	1152.	DISTILLA	-73.	0	0.32	0.35	0.30

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28693 MW 3.60 PROCESS MILLIONS BTU/HR 350.0 PROCESS TEMP(F) 366. PRODUCT ISOPROPANOL- HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.035

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 41. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	41.	16.	34.	10.	12.	4.	400.	0.	434.	DISTILLA	434.	10	0.04	0.03	0.81
41 GTRW16 GT-85RE-16 HEAT	41.	492.	1048.	315.	374.	110.	41.	-1131.	1089.	DISTILLA	-42.	0	0.32	0.34	0.32
42 GTR308 GT-60RE-08 POWR	41.	14.	40.	13.	12.	4.	397.	0.	436.	DISTILLA	436.	10	0.03	0.03	0.80
42 GTR308 GT-60RE-08 HEAT	41.	340.	982.	315.	304.	89.	41.	-913.	1023.	DISTILLA	110.	0	0.26	0.30	0.34
43 GTR312 GT-60RE-12 POWR	41.	16.	36.	12.	12.	4.	398.	0.	434.	DISTILLA	434.	10	0.04	0.03	0.81
43 GTR312 GT-60RE-12 HEAT	41.	436.	950.	315.	325.	95.	41.	-977.	992.	DISTILLA	14.	0	0.31	0.33	0.35
44 GTR316 GT-60RE-16 POWR	41.	16.	36.	12.	12.	4.	398.	0.	434.	DISTILLA	434.	10	0.04	0.03	0.81
44 GTR316 GT-60RE-16 HEAT	41.	427.	944.	315.	320.	94.	41.	-962.	985.	DISTILLA	24.	0	0.31	0.32	0.36
45 FCPADS FUEL-CL-PH POWR	41.	13.	32.	5.	12.	4.	405.	0.	438.	DISTILLA	438.	0	0.03	0.03	0.80
45 FCPADS FUEL-CL-PH HEAT	41.	718.	1853.	315.	704.	206.	41.	-2162.	1894.	DISTILLA	-268.	0	0.28	0,37	0.18
46 FCMCDS FUEL-CL-MO POWR	41.	17.	30.	7.	12.	4.	404.	0.	433	DISTILLA	433.	10	0.04	0.03	0.81
46 FCMCDS FUEL-CL-MO HEAT	41.	759.	1352.	315.	557.	163.	41.	-1702.	1393.	DISTILLA	-309	0	0.36	0.40	0.25

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28691 MW 3.30 PROCESS MILLIONS BTU/HR 400.0 PROCESS TEMP(F) 460. PRODUCT ETHANOL HOURS PER YEAR 7900

POWER TO HEAT RATIO 0.028

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 71. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	71.	0.	0.	0.	0.	0.	471.	35.	471.	COAL-FGD	506.	0	0.	0.02	0.79
1 STM141 STM-TURB-1 POWR	71.	22.	148.	115.	11.	3.	336.	0.	484.	RESIDUAL	484.	10	0.05	0.02	0.83
1 STM141 STM-TURB-1 HEAT	71.	77.	517.	400.	39.	12.	0.	-88.	517.	RESIDUAL	429.	0	0.15	0.08	0.77
1 STM141 STM-TURB-1 POWR	71.	22.	148.	115.	11.	3.	336.	0.	484.	COAL-FGD	484.	10	0.05	0.02	0.83
1 STM141 STM-TURB-1 HEAT	71.	77.	517.	400.	39.	12.	0.	-88.	517.	COAL-FGD	429.	0	0.15	0.08	0.77
1 STM141 STM-TURB-1 POWR	71.	22.	148.	115.	11.	3.	336.	0.	484.	COAL-AFB	484.	10	0.05	0.02	0.83
1 STM141 STM-TURB-1 HEAT	71.	77.	517.	400.	39.	12.	0.	-88.	517.	COAL-AFB	429.	0	0.15	0.08	0.77
2 STM088 STM-TURB-8 POWR	71.	22.	284.	230.	11.	3.	200.	0.	484.	RESIDUAL	484.	11	0.05	0.02	0.83
2 STM088 STM-TURB-8 HEAT	71.	38.	494.	400.	20.	6.	0.	-26.	494.	RESIDUAL	468.	1	0.08	0.04	0.81
2 STM088 STM-TURB-8 POWR	71.	22.	284.	230.	11.	3.	200.	0.	484.	COAL-FGD	484.	11	0.05	0.02	0.83
2 STM088 STM-TURB-8 HEAT	71.	38.	494.	400.	20.	6.	0.	-26.	494.	COAL-FGD	468.	1	0.08	0.04	0.81
2 STM088 STM-TURB-8 POWR	71.	22.	284.	230.	11.	3.	200.	0.	484.	COAL-AFB	484.	11	0.05	0.02	0.83
2 STM088 STM-TURB-8 HEAT	71.	38.	494.	400.	20.	6.	0.	-26.	494.	COAL-AFB	468.	1	0.08	0.04	0.81
3 PFBSTM PFB-STMTB- POWR	71.	21.	75.	51.	11.	3.	410.	0.	485.	COAL-PFB	485.	10	0.05	0.02	0.82
3 PFBSTM PFB-STMTB- HEAT	71.	163.	582.	400.	88.	26.	0.	-239.	582.	COAL-PFB	343.	0	0.24	0.15	0.69
4 TISTMT TI-STMTB-1 POWR	71.	21.	56.	36.	11.	3.	429.	0.	484.	RESIDUAL	484.	10	0.05	0.02	0.83
4 TISTMT TI-STMTB-1 HEAT	71.	205.	531.	340.	108.	32.	71.	-301.	601.	RESIDUAL	301.	0	0.28	0.18	0.67
4 TISTMT TI-STMTB-1 POWR	71.	21.	56.	36.	11.	3.	429.	0.	484.	COAL	484.	10	0.05	0.02	0.83
4 TISTMT TI-STMTB-1 HEAT	71.	241.	625.	400.	127.	37.	0.	-360.	625.	COAL	264.	0	0.30	0.20	0.64
5 TIHRSG THERMIONIC POWR	71.	13.	80.	49.	11.	3.	413.	0.	493.	RESIDUAL	493.	0	0.03	0.02	0.81
5 TIHRSG THERMIONIC HEAT	71.	88.	557.	340.	78.	23.	71.	-210.	628.	RESIDUAL	418.	0	0.14	0.12	0.64
5 TIHRSG THERMIONIC POWR	71.	13.	80.	49.	11.	3.	413.	0.	493.	COAL	493.	0	0.03	0.02	0.81
5 TIHRSG THERMIONIC HEAT	71.	103.	655.	400.	92.	27.	0.	-253.	655.	COAL	402.	0	0.15	0.14	0.61
6 STIRL STIRLING-1 POWR	71.	15.	50.	25.	11.	3.	441.	0.	491.	DISTILLA	491.	0	0.03	0.02	0.81
6 STIRL STIRLING-1 HEAT	71.	204.	678.	340.	154.	45.	71.	-447.	749.	DISTILLA	302.	0	0.23	0.21	0.53

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28694 MW 3.30 PROCESS MILLIONS BTU/HR 400.0 PROCESS TEMP(F) 460. PRODUCT ETHANOL HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.028

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 71. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	71.	15.	50.	25.	11.	3.	441.	0.	491.	RESIDUAL	491.	0	0.03	0.02	0.81
6	STIRL	STIRLING-1	HEAT	71.	204.	678.	340.	154.	45.	71.	-447.	749.	RESIDUAL	302.	0	0.23	0.21	0.53
6	STIRL	STIRLING-1	POWR	71.	15.	50.	25.	11.	3.	441.	0.	491.	COAL	491.	0	0.03	0.02	0.81
6	STIRL	STIRLING-1	HEAT	71.	240.	798.	400.	181.	53.	0.	-532.	798.	COAL	266.	0	0.25	0.23	0.50
7	HEGT85	HELIUM-GT-	POWR	71.	-2.	35.	-1.	11.	3.	472.	0.	507.	COAL-AFB	507.	11	-0.00	0.02	0.79
7	HEGT85	HELIUM-GT-	HEAT	-10030.	439.	-10030.	400.	-3220.	-944.	0.	10097.	-10030.	COAL-AFB	67.	11	*****	*****	6.01
8	HEGT60	HELIUM-GT-	POWR	71.	1.	43.	8.	11.	3.	461.	0.	504.	COAL-AFB	504.	10	0.00	0.02	0.79
8	HEGT60	HELIUM-GT-	HEAT	71.	64.	2134.	400.	553.	162.	0.	-1692.	2134.	COAL-AFB	442.	0	0.03	0.26	0.19
9	HEGT00	HELIUM-GT-	POWR	71.	6.	64.	30.	11.	3.	435.	0.	499.	COAL-AFB	499.	10	0.01	0.02	0.80
9	HEGT00	HELIUM-GT-	HEAT	71.	86.	854.	400.	150.	44.	0.	-434.	854.	COAL-AFB	419.	10	0.10	0.18	0.47
10	FCMCCL	FUEL-CL-MO	POWR	0.	19.	37.	17.	11.	3.	450.	0.	487.	COAL	487.	10	-0.12	0.02	0.82
10	FCMCCL	FUEL-CL-MO	HEAT	0.	428.	849.	400.	258.	76.	0.	-772.	849.	COAL	78.	10	0.30	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	19.	32.	14.	11.	3.	454.	0.	487.	COAL	487.	10	-0.12	0.02	0.82
11	FCSTCL	FUEL-CL-ST	HEAT	0.	548.	925.	400.	321.	94.	0.	-968.	925.	COAL	-43.	10	0.34	0.35	0.43
12	IGGTST	INT-GAS-GT	POWR	0.	14.	46.	21.	11.	3.	445.	0.	491.	COAL	491.	10	-0.13	0.02	0.81
12	IGGTST	INT-GAS-GT	HEAT	0.	270.	861.	400.	211.	62.	0.	-625.	861.	COAL	236.	10	0.19	0.25	0.46
13	GTSOAR	GT-HRSG-10	POWR	71.	14.	39.	15.	11.	3.	453.	0.	491.	RESIDUAL	491.	10	0.03	0.02	0.81
13	GTSOAR	GT-HRSG-10	HEAT	71.	319.	865.	340.	251.	74.	71.	-749.	935.	RESIDUAL	187.	0	0.27	0.27	0.43
14	GTAC08	GT-HRSG-08	POWR	71.	19.	42.	22.	11.	3.	445.	0.	487.	RESIDUAL	487.	10	0.04	0.02	0.82
14	GTAC08	GT-HRSG-08	HEAT	71.	297.	659.	340.	178.	52.	71.	-521.	730.	RESIDUAL	209.	0	0.31	0.24	0.55
15	GTAC12	GT-HRSG-12	POWR	71.	18.	37.	17.	11.	3.	450.	0.	487.	RESIDUAL	487.	10	0.04	0.02	0.82
15	GTAC12	GT-HRSG-12	HEAT	71.	366.	735.	340.	224.	66.	71.	-665.	805.	RESIDUAL	140.	0	0.33	0.28	0.50
16	GTAC16	GT-HRSG-16	POWR	71.	18.	35.	15.	11.	3.	453.	0.	488.	RESIDUAL	488.	10	0.04	0.02	0.82
16	GTAC16	GT-HRSG-16	HEAT	71.	408.	804.	340.	260.	76.	71.	-776.	875.	RESIDUAL	98.	0	0.34	0.30	0.46
17	GTWC16	GT-HRSG-16	POWR	71.	16.	36.	14.	11.	3.	454.	0.	489.	RESIDUAL	489.	10	0.04	0.02	0.82
17	GTWC16	GT-HRSG-16	HEAT	71.	387.	839.	340.	264.	77.	71.	-790.	909.	RESIDUAL	119.	0	0.32	0.29	0.44

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28601 MW 3.30 PROCESS MILLIONS BTU/HR 400.0 PROCESS TEMP(F) 460. PRODUCT ETHANOL HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.028

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 71. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	71.	16.	32.	11.	11.	3.	458.	0.	490.	RESIDUAL	490.	11	0.04	0.02	0.82
18 CC1626 GTST-16/26 HEAT	71.	490.	1003.	340.	350.	102.	71.	-1057.	1074.	RESIDUAL	16.	1	0.33	0.33	0.37
19 CC1622 GTST-16/22 POWR	71.	17.	33.	12.	11.	3.	456.	0.	489.	RESIDUAL	489.	11	0.04	0.02	0.82
19 CC1622 GTST-16/22 HEAT	71.	461.	916.	340.	313.	92.	71.	-942.	987.	RESIDUAL	45.	1	0.33	0.32	0.41
20 CC1222 GTST-12/22 POWR	71.	17.	33.	12.	11.	3.	456.	0.	489.	RESIDUAL	489.	11	0.04	0.02	0.82
20 CC1222 GTST-12/22 HEAT	71.	461.	907.	340.	310.	91.	71.	-933.	978.	RESIDUAL	45.	1	0.34	0.32	0.41
21 CC0822 GTST-08/22 POWR	71.	18.	36.	16.	11.	3.	452.	0.	488.	RESIDUAL	488.	11	0.04	0.02	0.82
21 CC0822 GTST-08/22 HEAT	71.	384.	767.	340.	240.	70.	71.	-716.	837.	RESIDUAL	122.	1	0.33	0.29	0.48
22 STIG15 STIG-15-16 POWR	71.	6.	30.	0.	11.	3.	470.	0.	500.	RESIDUAL	500.	11	0.01	0.02	0.80
22 STIG15 STIG-15-16 HEAT	71.	5386.	26154.	340.	9965.	2920.	71.	-31104.	26224.	RESIDUAL	-4880.	1	0.17	0.38	0.02
23 STIG10 STIG-10-16 POWR	71.	9.	31.	4.	11.	3.	466.	0.	497.	RESIDUAL	497.	11	0.02	0.02	0.80
23 STIG10 STIG-10-16 HEAT	71.	714.	2566.	340.	921.	270.	71.	-2844.	2637.	RESIDUAL	-208.	1	0.22	0.35	0.15
24 STIG1S STIG-1S-16 POWR	71.	10.	34.	7.	11.	3.	462.	0.	496.	RESIDUAL	496.	11	0.02	0.02	0.81
24 STIG1S STIG-1S-16 HEAT	71.	477.	1613.	340.	541.	158.	71.	-1654.	1683.	RESIDUAL	29.	1	0.23	0.32	0.24
25 DEADV3 DIESEL-ADV POWR	71.	11.	30.	5.	11.	3.	465.	0.	495.	RESIDUAL	495.	1	0.02	0.02	0.81
25 DEADV3 DIESEL-ADV HEAT	71.	728.	2058.	340.	763.	224.	71.	-2351.	2128.	RESIDUAL	-222.	1	0.26	0.36	0.19
26 DEADV2 DIESEL-ADV POWR	71.	14.	30.	8.	11.	3.	462.	0.	492.	RESIDUAL	492.	1	0.03	0.02	0.81
26 DEADV2 DIESEL-ADV HEAT	71.	613.	1339.	340.	497.	146.	71.	-1517.	1409.	RESIDUAL	-108.	1	0.31	0.35	0.28
27 DEADV1 DIESEL-ADV POWR	71.	19.	30.	12.	11.	3.	457.	0.	487.	RESIDUAL	487.	1	0.04	0.02	0.82
27 DEADV1 DIESEL-ADV HEAT	71.	539.	870.	340.	323.	95.	71.	-973.	940.	RESIDUAL	-33.	1	0.38	0.34	0.43
28 DEHTPH ADV-DIESEL POWR	71.	16.	39.	17.	11.	3.	451.	0.	490.	RESIDUAL	490.	0	0.04	0.02	0.82
28 DEHTPH ADV-DIESEL HEAT	71.	317.	792.	340.	227.	66.	71.	-673.	862.	RESIDUAL	189.	0	0.29	0.26	0.46
29 DESOA3 DIESEL-SOA POWR	71.	9.	31.	4.	11.	3.	466.	0.	497.	DISTILLA	497.	1	0.02	0.02	0.80
29 DESOA3 DIESEL-SOA HEAT	71.	732.	2591.	340.	935.	274.	71.	-2888.	2662.	DISTILLA	-226.	1	0.22	0.35	0.15
29 DESOA3 DIESEL-SOA POWR	71.	9.	31.	4.	11.	3.	466.	0.	497.	RESIDUAL	497.	1	0.02	0.02	0.80
29 DESOA3 DIESEL-SOA HEAT	71.	732.	2591.	340.	935.	274.	71.	-2886.	2662.	RESIDUAL	-226.	1	0.22	0.35	0.15

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

18SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28694 MW 3.30 PROCESS MILLIONS BTU/HR 400.0 PROCESS TEMP(F) 460. PRODUCT ETHANOL HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.028

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 71. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	71.	12.	31.	7.	11.	3.	463.	0.	494.	DISTILLA	494.	1	0.03	0.02	0.81
30 DESOA2 DIESEL-SOA HEAT	71.	598.	1545.	340.	558.	164.	71.	-1708.	1616.	DISTILLA	-92.	1	0.28	0.35	0.25
30 DESOA2 DIESEL-SOA POWR	71.	12.	31.	7.	11.	3.	463.	0.	494.	RESIDUAL	494.	1	0.03	0.02	0.81
30 DESOA2 DIESEL-SOA HEAT	71.	598.	1545.	340.	558.	164.	71.	-1708.	1616.	RESIDUAL	-92.	1	0.28	0.35	0.25
31 DESOA1 DIESEL-SOA POWR	71.	19.	31.	13.	11.	3.	456.	0.	487.	DISTILLA	487.	1	0.04	0.02	0.82
31 DESOA1 DIESEL-SOA HEAT	71.	509.	848.	340.	306.	90.	71.	-921.	918.	DISTILLA	-3.	1	0.37	0.33	0.44
31 DESOA1 DIESEL-SOA POWR	71.	19.	31.	13.	11.	3.	456.	0.	487.	RESIDUAL	487.	1	0.04	0.02	0.82
31 DESOA1 DIESEL-SOA HEAT	71.	509.	848.	340.	306.	90.	71.	-921.	918.	RESIDUAL	-3.	1	0.37	0.33	0.44
32 GTSOAD GT-HRSG-10 POWR	71.	17.	39.	18.	11.	3.	450.	0.	489.	DISTILLA	489.	10	0.04	0.02	0.82
32 GTSOAD GT-HRSG-10 HEAT	71.	334.	749.	340.	219.	64.	71.	-648.	819.	DISTILLA	171.	0	0.31	0.27	0.49
33 GTRA08 GT-85RE-08 POWR	71.	14.	32.	9.	11.	3.	460.	0.	491.	DISTILLA	491.	10	0.03	0.02	0.81
33 GTRA08 GT-85RE-08 HEAT	71.	535.	1170.	340.	418.	122.	71.	-1270.	1241.	DISTILLA	-30.	0	0.31	0.34	0.32
34 GTRA12 GT-85RE-12 POWR	71.	15.	31.	10.	11.	3.	459.	0.	491.	DISTILLA	491.	10	0.03	0.02	0.82
34 GTRA12 GT-85RE-12 HEAT	71.	531.	1103.	340.	395.	116.	71.	-1199.	1174.	DISTILLA	-25.	0	0.32	0.34	0.34
35 GTRA16 GT-85RE-16 POWR	71.	15.	32.	11.	11.	3.	458.	0.	490.	DISTILLA	490.	10	0.04	0.02	0.82
35 GTRA16 GT-85RE-16 HEAT	71.	493.	1031.	340.	360.	105.	71.	-1089.	1102.	DISTILLA	12.	0	0.32	0.33	0.36
36 GTR208 GT-60RE-08 POWR	71.	16.	35.	13.	11.	3.	455.	0.	490.	DISTILLA	490.	10	0.04	0.02	0.82
36 GTR208 GT-60RE-08 HEAT	71.	400.	899.	340.	288.	84.	71.	-864.	970.	DISTILLA	106.	0	0.31	0.30	0.41
37 GTR212 GT-60RE-12 POWR	71.	16.	34.	12.	11.	3.	456.	0.	490.	DISTILLA	490.	10	0.04	0.02	0.82
37 GTR212 GT-60RE-12 HEAT	71.	429.	936.	340.	309.	91.	71.	-930.	1007.	DISTILLA	77.	0	0.31	0.31	0.40
38 GTR216 GT-60RE-16 POWR	71.	16.	33.	12.	11.	3.	456.	0.	490.	DISTILLA	490.	10	0.04	0.02	0.82
38 GTR216 GT-60RE-16 HEAT	71.	450.	944.	340.	318.	93.	71.	-959.	1015.	DISTILLA	56.	0	0.32	0.31	0.39
39 GTRW08 GT-85RE-08 POWR	71.	12.	32.	8.	11.	3.	461.	0.	493.	DISTILLA	493.	10	0.03	0.02	0.81
39 GTRW08 GT-85RE-08 HEAT	71.	535.	1394.	340.	489.	143.	71.	-1494.	1465.	DISTILLA	-29.	0	0.28	0.33	0.27
40 GTRW12 GT-85RE-12 POWR	71.	14.	31.	8.	11.	3.	461.	0.	492.	DISTILLA	492.	10	0.03	0.02	0.81
40 GTRW12 GT-85RE-12 HEAT	71.	583.	1328.	340.	483.	142.	71.	-1475.	1398.	DISTILLA	-77.	0	0.30	0.35	0.29

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28694 MW 3.30 PROCESS MILLIONS BTU/HR 400.0 PROCESS TEMP(F) 460. PRODUCT ETHANOL HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.028

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 71. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	GTRW16	GT-85RE-16	POWR	71.	14.	32.	9.	11.	3.	460.	0.	492.	DISTILLA	492.	10	0.03	0.02	0.81
41	GTRW16	GT-85RE-16	HEAT	71.	541.	1221.	340.	436.	128.	71.	-1327.	1292	DISTILLA	-35.	0	0.31	0.34	0.31
42	GTR308	GT-60RE-08	POWR	71.	11.	36.	10.	11.	3.	458.	0.	495.	DISTILLA	495.	10	0.03	0.02	0.81
42	GTR308	GT-60RE-08	HEAT	71.	363.	1179.	340.	365.	107.	71.	-1107.	1249.	DISTILLA	143.	0	0.24	0.29	0.32
43	GTR312	GT-60RE-12	POWR	71.	15.	33.	11.	11.	3.	458.	0.	491.	DISTILLA	491.	10	0.03	0.02	0.81
43	GTR312	GT-60RE-12	HEAT	71.	473.	1065.	340.	364.	107.	71.	-1103.	1136.	DISTILLA	33.	0	0.31	0.32	0.35
44	GTR316	GT-60RE-16	POWR	71.	15.	33.	11.	11.	3.	458.	0.	491.	DISTILLA	491.	10	0.03	0.02	0.81
44	GTR316	GT-60RE-16	HEAT	71.	463.	1056.	340.	358.	105.	71.	-1084.	1127.	DISTILLA	43.	0	0.30	0.32	0.36
45	FCPADS	FUEL-CL-PH	POWR	71.	11.	30.	5.	11.	3.	465.	0	494.	DISTILLA	494.	0	0.03	0.02	0.81
45	FCPADS	FUEL-CL-PH	HEAT	71.	775.	2000.	340.	760.	223.	71.	-2343	2071.	DISTILLA	-269.	0	0.28	0.37	0.19
46	FCMCDS	FUEL-CL-MO	POWR	71.	15.	27.	6.	11.	3.	463.	0.	490.	DISTILLA	490.	10	0.04	0.02	0.82
46	FCMCDS	FUEL-CL-MO	HEAT	71.	820.	1459.	340.	601.	176.	71.	-1844.	1530.	DISTILLA	-314.	0	0.36	0.39	0.26

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28731 MW 3.50 PROCESS MILLIONS BTU/HR 640.0 PROCESS TEMP(F) 598. PRODUCT AMMONIA-SYNT HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.019

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	753.	37.	753.	COAL-FGD	790.	0	0.	0.02	0.81
1 STM141	STM-TURB-1	POWR	0.	-3392.	4183.	3543.	12.	4.	-3416.	0.	4183.	RESIDUAL	4183.	11	-4.29	0.00	0.15
1 STM141	STM-TURB-1	HEAT	0.	4.	755.	640.	2.	1.	0.	31.	755.	RESIDUAL	786.	11	0.01	0.00	0.81
1 STM141	STM-TURB-1	POWR	0.	-3392.	4183.	3543.	12.	4.	-3416.	0.	4183.	COAL-FGD	4183.	11	-4.29	0.00	0.15
1 STM141	STM-TURB-1	HEAT	0.	4.	755.	640.	2.	1.	0.	31.	755.	COAL-FGD	786.	11	0.01	0.00	0.81
1 STM141	STM-TURB-1	POWR	0.	-3392.	4183.	3543.	12.	4.	-3416.	0.	4183.	COAL-AFB	4183.	11	-4.29	0.00	0.15
1 STM141	STM-TURB-1	HEAT	0.	4.	755.	640.	2.	1.	0.	31.	755.	COAL-AFB	786.	11	0.01	0.00	0.81
2 STM088	STM-TURB-8	POWR	0.	23.	-334.	-296.	12.	4.	1101.	0.	767.	RESIDUAL	767.	11	0.03	0.02	0.83
2 STM088	STM-TURB-8	HEAT	0.	-50.	723.	640.	-26.	-8.	0.	118.	723.	RESIDUAL	841.	11	-0.06	-0.03	0.76
2 STM088	STM-TURB-8	POWR	0.	23.	-334.	-296.	12.	4.	1101.	0.	767.	COAL-FGD	767.	11	0.03	0.02	0.83
2 STM088	STM-TURB-8	HEAT	0.	-50.	723.	640.	-26.	-8.	0.	118.	723.	COAL-FGD	841.	11	-0.06	-0.03	0.76
2 STM088	STM-TURB-8	POWR	0.	23.	-334.	-296.	12.	4.	1101.	0.	767.	COAL-AFB	767.	11	0.03	0.02	0.83
2 STM088	STM-TURB-8	HEAT	0.	-50.	723.	640.	-26.	-8.	0.	118.	723.	COAL-AFB	841.	11	-0.06	-0.03	0.76
3 PFBSTM	PFB-STMTB-	POWR	0.	21.	135.	101.	12.	4.	635.	0	770.	COAL-PFB	770.	10	0.03	0.02	0.83
3 PFBSTM	PFB-STMTB-	HEAT	0.	131.	860.	640.	76.	22.	0.	-200.	860.	COAL-PFB	660.	0	0.13	0.09	0.74
4 TISTMT	TI-STMTB-1	POWR	0.	23.	85.	60.	12.	4.	683.	0.	768.	RESIDUAL	768.	11	0.03	0.02	0.83
4 TISTMT	TI-STMTB-1	HEAT	0.	242.	911.	640.	128.	38.	0.	-363.	911.	RESIDUAL	548.	1	0.21	0.14	0.70
4 TISTMT	TI-STMTB-1	POWR	0.	23.	85.	60.	12.	4.	683.	0.	768.	COAL	768.	11	0.03	0.02	0.83
4 TISTMT	TI-STMTB-1	HEAT	0.	242.	911.	640.	128.	38.	0.	-363.	911.	COAL	548.	1	0.21	0.14	0.70
5 TIHRSG	THERMIONIC	POWR	0.	7.	85.	46.	12.	4.	699.	0.	784.	RESIDUAL	784.	0	0.01	0.02	0.82
5 TIHRSG	THERMIONIC	HEAT	0.	93.	1177.	640.	166.	49.	0.	-480.	1177.	RESIDUAL	697.	0	0.07	0.14	0.54
5 TIHRSG	THERMIONIC	POWR	0.	7.	85.	46.	12.	4.	699.	0.	784.	COAL	784.	0	0.01	0.02	0.82
5 TIHRSG	THERMIONIC	HEAT	0.	93.	1177.	640.	166.	49.	0.	-480.	1177.	COAL	697.	0	0.07	0.14	0.54
6 STIRL	STIRLING-1	POWR	0.	14.	65.	35.	12.	4.	711.	0.	776.	DISTILLA	776.	1	0.02	0.02	0.82
6 STIRL	STIRLING-1	HEAT	0.	252.	1178.	640.	217.	63.	0.	-640.	1178.	DISTILLA	538.	1	0.18	0.18	0.54

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28731 MW 3.50 PROCESS MILLIONS BTU/HR 640.0 PROCESS TEMP(F) 598. PRODUCT AMMONIA-SYNT HOURS PER YEAR 8400.

POWER TO HEAT RATIO 0.019

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	14.	65.	35.	12.	4.	711.	0.	776.	RESIDUAL	776.	1	0.02	0.02	0.82
6	STIRL	STIRLING-	HEAT	0.	252.	1178.	640.	217.	63.	0.	-640.	1178.	RESIDUAL	538.	1	0.18	0.18	0.54
6	STIRL	STIRLING-1	POWR	0.	14.	65.	35.	12.	4.	711.	0.	776.	COAL	776.	1	0.02	0.02	0.82
6	STIRL	STIRLING-1	HEAT	0.	252.	1178.	640.	217.	63.	0.	-640.	1178.	COAL	538.	1	0.18	0.18	0.54
7	HEGT85	HELIUM-GT-	POWR	0.	-14.	37.	-12.	12.	4.	767.	0.	804.	COAL-AFB	804.	11	-0.02	0.01	0.80
7	HEGT85	HELIUM-GT-	HEAT	-1960.	747.	-1960.	640.	-629.	-184.	0.	2003.	-1960.	COAL-AFB	43.	11	-1.53	*****	14.73
8	HEGT60	HELIUM-GT-	POWR	0.	-10.	46.	-1.	12.	4.	754.	0.	800.	COAL-AFB	800.	11	-0.01	0.01	0.80
8	HEGT60	HELIUM-GT-	HEAT	-45897.	9502.	-45897.	640.	-11887.	-3484.	0.	37185.	-45897.	COAL-AFB	-8712.	11	*****	1.36	-0.07
9	HEGT00	HELIUM-GT-	POWR	0.	5.	68.	30.	12.	4.	717.	0.	785.	COAL-AFB	785.	10	0.01	0.02	0.82
9	HEGT00	HELIUM-GT-	HEAT	0.	108.	1434.	640.	252.	74.	0.	-751.	1434.	COAL-AFB	683.	0	0.07	0.18	0.45
10	FCMCCL	FUEL-CL-MO	POWR	0.	20.	39.	18.	12.	4.	731.	0.	771.	COAL	771.	10	0.02	0.02	0.83
10	FCMCCL	FUEL-CL-MO	HEAT	0.	684.	1371.	640.	417.	122.	0.	-1265.	1371.	COAL	106.	0	0.33	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	20.	39.	18.	12.	4.	731.	0.	770.	COAL	770.	11	0.03	0.02	0.83
11	FCSTCL	FUEL-CL-ST	HEAT	0.	701.	1358.	640.	418.	123.	0.	-1269.	1358.	COAL	89.	11	0.34	0.31	0.47
12	IGGTST	INT-GAS-GT	POWR	0.	14.	59.	30.	12.	4.	717.	0.	777.	COAL	777.	11	0.02	0.02	0.82
12	IGGTST	INT-GAS-GT	HEAT	0.	287.	1258.	640.	253.	74.	0.	-755.	1258.	COAL	504.	11	0.19	0.20	0.51
13	GTSOAR	GT-HRSG-10	POWR	0.	13.	41.	14.	12.	4.	737.	0.	778.	RESIDUAL	778.	10	0.02	0.02	0.82
13	GTSOAR	GT-HRSG-10	HEAT	0.	576.	1893.	640.	549.	161.	0.	-1678.	1893.	RESIDUAL	215.	0	0.23	0.29	0.34
14	GTAC08	GT-HRSG-08	POWR	0.	20.	44.	23.	12	4.	726.	0.	771.	RESIDUAL	771.	10	0.03	0.02	0.83
14	GTAC08	GT-HRSG-08	HEAT	0.	558.	1249.	640.	337.	99.	0.	-1016.	1249.	RESIDUAL	232.	0	0.31	0.27	0.51
15	GTAC12	GT-HRSG-12	POWR	0.	20.	39.	18.	12.	4.	731.	0.	770.	RESIDUAL	770.	10	0.03	0.02	0.83
15	GTAC12	GT-HRSG-12	HEAT	0.	689.	1362.	640.	415.	122.	0.	-1261.	1362.	RESIDUAL	101.	0	0.34	0.31	0.47
16	GTAC16	GT-HRSG-16	POWR	0.	18.	37.	15.	12.	4.	735.	0.	772.	RESIDUAL	772.	10	0.02	0.02	0.83
16	GTAC16	GT-HRSG-16	HEAT	0.	767.	1542.	640.	498.	146.	0.	-1519.	1542.	RESIDUAL	23.	0	0.33	0.32	0.42
17	GTWC16	GT-HRSG-16	POWR	0.	18.	38.	15.	12.	4.	735.	0.	773.	RESIDUAL	773.	10	0.02	0.02	0.83
17	GTWC16	GT-HRSG-16	HEAT	0.	728.	1576.	640.	497.	146.	0.	-1514.	1576.	RESIDUAL	62.	0	0.32	0.32	0.41

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POWER TO HEAT RATIO 0.019

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	16.	38.	14.	12.	4.	736.	0.	774.	RESIDUAL	774.	11	0.02	0.02	0.83
18 CC1626 GTST-16/26 HEAT	0.	734.	1725.	640.	546.	160.	0.	-1669.	1725.	RESIDUAL	56.	1	0.30	0.32	0.37
19 CC1622 GTST-16/22 POWR	0.	17.	39.	16.	12.	4.	734.	0.	773.	RESIDUAL	773.	11	0.02	0.02	0.83
19 CC1622 GTST-16/22 HEAT	0.	688.	1578.	640.	484.	142.	0.	-1475.	1578.	RESIDUAL	103.	1	0.30	0.31	0.41
20 CC1222 GTST-12/22 POWR	0.	17.	39.	16.	12.	4.	734.	0.	773.	RESIDUAL	773.	11	0.02	0.02	0.83
20 CC1222 GTST-12/22 HEAT	0.	685.	1560.	640.	477.	140.	0.	-1455.	1560.	RESIDUAL	105.	1	0.31	0.31	0.41
21 CC0822 GTST-08/22 POWR	0.	18.	44.	21.	12.	4.	728.	0.	772.	RESIDUAL	772.	11	0.02	0.02	0.83
21 CC0822 GTST-08/22 HEAT	0.	553.	1318.	640.	358.	105.	0.	-1081.	1318.	RESIDUAL	237.	1	0.30	0.27	0.49
22 STIG15 STIG-15-16 POWR	0.	6.	31.	0.	12.	4.	752.	0.	784.	RESIDUAL	784.	11	0.01	0.02	0.82
22 STIG15 STIG-15-16 HEAT	0.	10138.	49231.	640.	18757.	5497.	0.	-58578.	49231.	RESIDUAL	-9347.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	9.	33.	4.	12.	4.	748.	0.	781.	RESIDUAL	781.	11	0.01	0.02	0.82
23 STIG10 STIG-10-16 HEAT	0.	1343.	4830.	640.	1735.	508.	0.	-5383.	4830.	RESIDUAL	-553.	1	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	11.	36.	8.	12	4.	744.	0.	780.	RESIDUAL	780.	11	0.01	0.02	0.82
24 STIG1S STIG-1S-16 HEAT	0.	897.	3036.	640.	1018.	298.	0.	-3143.	3036.	RESIDUAL	-107.	1	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	9.	32.	3.	12.	4.	749.	0.	781.	RESIDUAL	781.	1	0.01	0.02	0.82
25 DEADV3 DIESEL-ADV HEAT	0.	1708.	5990.	640.	2222.	651.	0.	-6907.	5990.	RESIDUAL	-917.	1	0.22	0.37	0.11
26 DEADV2 DIESEL-ADV POWR	0.	15.	32.	8.	12.	4.	743.	0.	776.	RESIDUAL	776.	1	0.02	0.02	0.83
26 DEADV2 DIESEL-ADV HEAT	0.	1155.	2520.	640.	935.	274.	0.	-2884.	2520.	RESIDUAL	-364.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	20.	32.	13.	12.	4.	738.	0.	770.	RESIDUAL	770.	1	0.03	0.02	0.83
27 DEADV1 DIESEL-ADV HEAT	0.	1014.	1637.	640.	607.	178.	0.	-1860.	1637.	RESIDUAL	-224.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	10.	57.	25.	12.	4.	723.	0.	780.	RESIDUAL	780.	1	0.01	0.02	0.82
28 DEHTPM ADV-DIESEL HEAT	0.	263.	1433.	640.	302.	88.	0.	-906.	1433.	RESIDUAL	527.	1	0.16	0.21	0.45
29 DESOA3 DIESEL-SOA POWR	0.	7.	33.	2.	12.	4.	750.	0.	783.	DISTILLA	783.	1	0.01	0.02	0.82
29 DESOA3 DIESEL-SOA HEAT	0.	1879.	8786.	640.	3172.	930.	0.	-9874.	8786.	DISTILLA	-1088.	1	0.18	0.36	0.07
29 DESOA3 DIESEL-SOA POWR	0.	7.	33.	2.	12.	4.	750.	0.	783.	RESIDUAL	783.	1	0.01	0.02	0.82
29 DESOA3 DIESEL-SOA HEAT	0.	1879.	8786.	640.	3172.	930.	0.	-9874.	8786.	RESIDUAL	-1088.	1	0.18	0.36	0.07

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INDUSTRY 28731 MW 3.50 PROCESS MILLIONS BTU/HR 640.0 PROCESS TEMP(F) 598. PRODUCT AMMONIA-SYNT HOURS PER YEAR 8400

POWER TO HEAT RATIO 0.019

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	13.	33.	7.	12.	4.	744.	0.	777.	DISTILLA	777.	1	0.02	0.02	0.82
30 DESOA2 DIESEL-SOA HEAT	0.	1126.	2909.	640.	1050.	308.	0.	-3244.	2909.	DISTILLA	-335.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	13.	33.	7.	12.	4.	744.	0.	777.	RESIDUAL	777.	1	0.02	0.02	0.82
30 DESOA2 DIESEL-SOA HEAT	0.	1126.	2909.	640.	1050.	308.	0.	-3244.	2909.	RESIDUAL	-335.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	20.	33.	13.	12.	4.	737.	0.	770.	DISTILLA	770.	1	0.03	0.02	0.83
31 DESOA1 DIESEL-SOA HEAT	0.	957.	1596.	640.	576.	169.	0.	-1763.	1596.	DISTILLA	-167.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	20.	33.	13.	12.	4.	737.	0.	770.	RESIDUAL	770.	1	0.03	0.02	0.83
31 DESOA1 DIESEL-SOA HEAT	0.	957.	1596.	640.	576.	169.	0.	-1763.	1596.	RESIDUAL	-167.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	18.	41.	19.	12.	4.	731.	0.	772.	DISTILLA	772.	10	0.02	0.02	0.83
32 GTSOAD GT-HRSG-10 HEAT	0.	630.	1407.	640.	411.	120.	0.	-1246.	1407.	DISTILLA	160.	0	0.31	0.29	0.45
33 GTRA08 GT-85RE-08 POWR	0.	12.	33.	7.	12.	4.	745.	0.	778.	DISTILLA	778.	10	0.01	0.02	0.82
33 GTRA08 GT-85RE-08 HEAT	0.	1118.	3161.	640.	1128.	331.	0.	-3489.	3161.	DISTILLA	-328.	0	0.26	0.36	0.20
34 GTRA12 GT-85RE-12 POWR	0.	13.	33.	8.	12.	4.	744.	0.	777.	DISTILLA	777.	10	0.02	0.02	0.82
34 GTRA12 GT-85RE-12 HEAT	0.	1075.	2710.	640.	970.	284.	0.	-2994.	2710.	DISTILLA	-284.	0	0.28	0.36	0.24
35 GTRA16 GT-85RE-16 POWR	0.	14.	34.	9.	12.	4.	742.	0.	776.	DISTILLA	776.	10	0.02	0.02	0.82
35 GTRA16 GT-85RE-16 HEAT	0.	968.	2374.	640.	829.	243.	0.	-2552.	2374.	DISTILLA	-178.	0	0.29	0.35	0.27
36 GTR208 GT-60RE-08 POWR	0.	15.	37.	13.	12.	4.	738.	0.	775.	DISTILLA	775.	10	0.02	0.02	0.83
36 GTR208 GT-60RE-08 HEAT	0.	753.	1893.	640.	606.	178.	0.	-1856.	1893.	DISTILLA	37.	0	0.28	0.32	0.34
37 GTR212 GT-60RE-12 POWR	0.	15.	36.	12.	12.	4.	739.	0.	775.	DISTILLA	775.	10	0.02	0.02	0.83
37 GTR212 GT-60RE-12 HEAT	0.	815.	1983.	640.	654.	192.	0.	-2007.	1983.	DISTILLA	-25.	0	0.29	0.33	0.32
38 GTR216 GT-60RE-16 POWR	0.	15.	35.	11.	12.	4.	740.	0.	775.	DISTILLA	775.	10	0.02	0.02	0.83
38 GTR216 GT-60RE-16 HEAT	0.	860.	2021.	640.	681.	200.	0.	-2091.	2021.	DISTILLA	-70.	0	0.30	0.34	0.32
39 GTRW08 GT-85RE-08 POWR	0.	10.	34.	6.	12.	4.	746.	0.	780.	DISTILLA	780.	10	0.01	0.02	0.82
39 GTRW08 GT-85RE-08 HEAT	0.	1098.	3559.	640.	1249.	366.	0.	-3867.	3559.	DISTILLA	-307.	0	0.24	0.35	0.18
40 GTRW12 GT-85RE-12 POWR	0.	12.	33.	7.	12.	4.	745.	0.	778.	DISTILLA	778.	10	0.02	0.02	0.82
40 GTRW12 GT-85RE-12 HEAT	0.	1183.	3124.	640.	1137.	333.	0.	-3516.	3124.	DISTILLA	-392.	0	0.27	0.36	0.20

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UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	13.	33.	8.	12.	4.	744.	0.	777.	DISTILLA	777.	10	0.02	0.02	0.82
41 GTRW16 GT-85RE-16 HEAT	0.	1063.	2680.	640.	957.	280.	0.	-2953.	2680.	DISTILLA	-273.	0	0.28	0.36	0.24
42 GTR308 GT-60RE-08 POWR	0.	10.	39.	9.	12.	4.	742.	0.	781.	DISTILLA	781.	10	0.01	0.02	0.82
42 GTR308 GT-60RE-08 HEAT	0.	670.	2651.	640.	822.	241.	0.	-2531.	2651.	DISTILLA	120.	0	0.20	0.31	0.24
43 GTR312 GT-60RE-12 POWR	0.	15.	35.	11.	12.	4.	741.	0.	775.	DISTILLA	775.	10	0.02	0.02	0.83
43 GTR312 GT-60RE-12 HEAT	0.	899.	2123.	640.	726.	213.	0.	-2231.	2123.	DISTILLA	-109.	0	0.30	0.34	0.30
44 GTR316 GT-60RE-16 POWR	0.	15.	35.	11.	12.	4.	740.	0.	776.	DISTILLA	776.	10	0.02	0.02	0.83
44 GTR316 GT-60RE-16 HEAT	0.	877.	2095.	640.	710.	208.	0.	-2182.	2095.	DISTILLA	-87.	0	0.30	0.34	0.31
45 FCPADS FUEL-CL-PH POWR	0.	12.	31.	5.	12.	4.	747.	0.	778.	DISTILLA	778.	0	0.02	0.02	0.82
45 FCPADS FUEL-CL-PH HEAT	0.	1459.	3765.	640.	1431.	419.	0.	-4433.	3765.	DISTILLA	-669.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	16.	29.	7.	12.	4.	745.	0.	774.	DISTILLA	774.	10	0.02	0.02	0.83
46 FCMCDS FUEL-CL-MO HEAT	0.	1543.	2747.	640.	1132.	332.	0.	-3499.	2747.	DISTILLA	-752.	0	0.36	0.41	0.23

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28741 MW 4.00 PROCESS MILLIONS BTU/HR 92.0 PROCESS TEMP(F) 353 PRODUCT PHOS-ACID+SU HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	108.	43.	108.	COAL-AFB	151.	0	0.	0.09	0.61
1 STM141 STM-TURB-1 POWR	0.	27.	79.	54.	14.	4.	45.	0.	124.	RESIDUAL	124.	10	0.18	0.11	0.74
1 STM141 STM-TURB-1 HEAT	0.	46.	136.	92.	[illegible]	7.	0.	-31.	136.	RESIDUAL	105.	10	0.25	0.17	0.68
1 STM141 STM-TURB-1 POWR	0.	27.	79.	54.	14.	4.	45.	0.	124.	COAL-FGD	124.	10	0.18	0.11	0.74
1 STM141 STM-TURB-1 HEAT	0.	46.	136.	92.	23.	7.	0.	-31.	136.	COAL-FGD	105.	10	0.25	0.17	0.68
1 STM141 STM-TURB-1 POWR	0.	27.	79.	54.	14.	4.	45.	0.	124.	COAL-AFB	124.	10	0.18	0.11	0.74
1 STM141 STM-TURB-1 HEAT	0.	46.	136.	92.	23.	7.	0.	-31.	136.	COAL-AFB	105.	10	0.25	0.17	0.68
2 STM088 STM-TURB-8 POWR	0.	27.	98.	70.	14.	4.	26.	0.	124.	RESIDUAL	124.	10	0.18	0.11	0.74
2 STM088 STM-TURB-8 HEAT	0.	35.	129.	92.	18.	5.	0.	-13.	129.	RESIDUAL	116.	0	0.21	0.14	0.71
2 STM088 STM-TURB-8 POWR	0.	27.	98.	70.	14.	4.	26.	0.	124.	COAL-FGD	124.	10	0.18	0.11	0.74
2 STM088 STM-TURB-8 HEAT	0.	35.	129.	92.	18.	5.	0.	-13.	129.	COAL-FGD	116.	0	0.21	0.14	0.71
2 STM088 STM-TURB-8 POWR	0.	27.	98.	70.	14.	4.	26.	0.	124.	COAL-AFB	124.	10	0.18	0.11	0.74
2 STM088 STM-TURB-8 HEAT	0.	35.	129.	92.	18.	5.	0.	-13.	129.	COAL-AFB	116.	0	0.21	0.14	0.71
3 PFBSTM PFB-STMTB- POWR	0.	26.	58.	35.	14.	4.	67.	0.	125.	COAL-PFB	125.	10	0.17	0.11	0.74
3 PFBSTM PFB-STMTB- HEAT	0.	68.	151.	92.	36.	10.	0.	-69.	151.	COAL-PFB	82.	10	0.31	0.24	0.61
4 TISTMT TI-STMTB-1 POWR	0.	26.	48.	27.	14.	4.	77.	0.	125.	RESIDUAL	125.	10	0.17	0.11	0.74
4 TISTMT TI-STMTB-1 HEAT	0.	89.	164.	92.	47.	14.	0.	-103.	164.	RESIDUAL	61.	0	0.35	0.28	0.56
4 TISTMT TI-STMTB-1 POWR	0.	26.	48.	27.	14.	4.	77.	0.	125.	COAL	125.	10	0.17	0.11	0.74
4 TISTMT TI-STMTB-1 HEAT	0.	89.	164.	92.	47.	14.	0.	-103.	164.	COAL	61.	0	0.35	0.28	0.56
5 TIHRSG THERMIONIC POWR	0.	20.	97.	63.	14.	4.	34.	0.	131.	RESIDUAL	131.	0	0.13	0.10	0.70
5 TIHRSG THERMIONIC HEAT	0.	29.	142.	92.	20.	6.	0.	-20.	142.	RESIDUAL	122.	0	0.17	0.14	0.65
5 TIHRSG THERMIONIC POWR	0.	20.	97.	63.	14.	4.	34.	0.	131.	COAL	131.	0	0.13	0.10	0.70
5 TIHRSG THERMIONIC HEAT	0.	29.	142.	92.	20.	6.	0.	-20.	142.	COAL	122.	0	0.17	0.14	0.65
6 STIRL STIRLING-1 POWR	0.	19.	54.	25.	14.	4.	78.	0.	132.	DISTILLA	132.	0	0.13	0.10	0.70
6 STIRL STIRLING-1 HEAT	0.	69.	194.	92.	49.	15.	0.	-112.	194.	DISTILLA	82.	0	0.26	0.26	0.47

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28741 MW 4.00 PROCESS MILLIONS BTU/HR 92.0 PROCESS TEMP(F) 353. PRODUCT PHOS-ACID+SU HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	19.	54.	25.	14.	4.	78.	0.	132.	RESIDUAL	132.	0	0.13	0.10	0.70
6	STIRL	STIRLING-1	HEAT	0.	69.	194.	92.	49.	15.	0.	-112.	194.	RESIDUAL	82.	0	0.26	0.26	0.47
6	STIRL	STIRLING-1	POWR	0.	19.	54.	25.	14.	4.	78.	0.	132.	COAL	132.	0	0.13	0.10	0.70
6	STIRL	STIRLING-1	HEAT	0.	69.	194.	92.	49.	15.	0.	-112.	194.	COAL	82.	0	0.26	0.26	0.47
7	HEGT85	HELIUM-GT-	POWR	0.	7.	43.	6.	14.	4.	101.	0.	144.	COAL-AFB	144.	10	0.05	0.09	0.64
7	HEGT85	HELIUM-GT-	HEAT	0.	110.	668.	92.	214.	63.	0.	-627.	668.	COAL-AFB	41.	0	0.14	0.32	0.14
8	HEGT60	HELIUM-GT-	POWR	0.	9.	53.	16.	14.	4.	89.	0.	142.	COAL-AFB	142.	10	0.06	0.10	0.65
8	HEGT60	HELIUM-GT-	HEAT	0.	50.	304.	92.	79.	23.	0.	-203.	304.	COAL-AFB	101.	10	0.14	0.26	0.30
9	HEGT00	HELIUM-GT-	POWR	0.	10.	78.	38.	14.	4.	63.	0.	141.	COAL-AFB	141.	10	0.07	0.10	0.65
9	HEGT00	HELIUM-GT-	HEAT	0.	24.	187.	92.	33.	10.	0.	-60.	187.	COAL-AFB	127.	10	0.11	0.18	0.49
10	FCMCCL	FUEL-CL-MO	POWR	0.	23.	45.	21.	14.	4.	83.	0.	128.	COAL	128.	10	0.15	0.11	0.72
10	FCMCCL	FUEL-CL-MO	HEAT	0.	99.	194.	92.	59.	17.	0.	-142.	194.	COAL	52.	10	0.34	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	24.	34.	13.	14.	4.	93.	0.	127.	COAL	127.	10	0.16	0.11	0.72
11	FCSTCL	FUEL-CL-ST	HEAT	0.	169.	243.	92.	97.	28.	0.	-260.	243.	COAL	-18.	10	0.41	0.40	0.38
12	IGGTST	INT-GAS-GT	POWR	0.	19.	45.	18.	14.	4.	87.	0.	132.	COAL	132.	10	0.13	0.10	0.70
12	IGGTST	INT-GAS-GT	HEAT	0.	96.	226.	92.	69.	20.	0.	-172.	226.	COAL	54.	10	0.30	0.30	0.41
13	GTSOAR	GT-HRSG-10	POWR	0.	19.	47.	20.	14.	4.	85.	0.	132.	RESIDUAL	132.	10	0.13	0.10	0.70
13	GTSOAR	GT-HRSG-10	HEAT	0.	88.	215.	92.	62.	18.	0.	-152.	215.	RESIDUAL	63.	0	0.29	0.29	0.43
14	GTAC08	GT-HRSG-08	POWR	0.	23.	51.	26.	14.	4.	78.	0.	128.	RESIDUAL	128.	10	0.15	0.11	0.72
14	GTAC08	GT-HRSG-08	HEAT	0.	80.	179.	92.	48.	14.	0.	-108.	179.	RESIDUAL	71.	0	0.31	0.27	0.51
15	GTAC12	GT-HRSG-12	POWR	0.	22.	45.	21.	14.	4.	84.	0.	129.	RESIDUAL	129.	10	0.15	0.11	0.72
15	GTAC12	GT-HRSG-12	HEAT	0.	99.	198.	92.	60.	18.	0.	-146.	198.	RESIDUAL	52.	0	0.33	0.31	0.46
16	GTAC16	GT-HRSG-16	POWR	0.	22.	42.	18.	14.	4.	87.	0	129.	RESIDUAL	129.	10	0.15	0.11	0.71
16	GTAC16	GT-HRSG-16	HEAT	0.	110.	212.	92.	68.	20.	0.	-171.	212.	RESIDUAL	41.	0	0.34	0.32	0.43
17	GTWC16	GT-HRSG-16	POWR	0.	20.	43.	18.	14.	4.	88.	0.	131.	RESIDUAL	131.	10	0.13	0.10	0.70
17	GTWC16	GT-HRSG-16	HEAT	0.	105.	227.	92.	72.	21.	0.	-181.	227.	RESIDUAL	45.	0	0.32	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

18SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28741 MW 4.00 PROCESS MILLIONS BTU/HR 92.0 PROCESS TEMP(F) 353. PRODUCT PHOS-ACID+SU HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	20.	35.	10.	14.	4.	96.	0.	131.	RESIDUAL	131.	10	0.13	0.10	0.70
18 CC1626 GTST-16/26 HEAT	0.	177.	310.	92.	121.	36.	0.	-336.	310.	RESIDUAL	-26.	0	0.36	0.39	0.30
19 CC1622 GTST-16/22 POWR	0.	21.	35.	11.	14.	4.	95.	0.	130.	RESIDUAL	130.	10	0.14	0.10	0.71
19 CC1622 GTST-16/22 HEAT	0.	167.	283.	92.	109.	32.	0.	-299.	283.	RESIDUAL	-16.	0	0.37	0.39	0.33
20 CC1222 GTST-12/22 POWR	0.	21.	35.	12.	14.	4.	95.	0.	130.	RESIDUAL	130.	10	0.14	0.11	0.71
20 CC1222 GTST-12/22 HEAT	0.	168.	280.	92.	109.	32.	0.	-298.	280.	RESIDUAL	-17.	0	0.37	0.39	0.33
21 CC0822 GTST-08/22 POWR	0.	23.	37.	14.	14.	4.	91.	0.	128.	RESIDUAL	128.	10	0.15	0.11	0.72
21 CC0822 GTST-08/22 HEAT	0.	144.	237.	92.	87.	26.	0.	-231.	237.	RESIDUAL	6.	0	0.38	0.37	0.39
22 STIG15 STIG-15-16 POWR	0.	7.	36.	0.	14.	4.	108.	0.	144.	RESIDUAL	144.	10	0.05	0.10	0.64
22 STIG15 STIG-15-16 HEAT	0.	1457.	7077.	92.	2695.	790.	0.	-8383.	7077.	RESIDUAL	-1306.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	11.	38.	5.	14.	4.	102.	0.	140.	RESIDUAL	140.	10	0.07	0.10	0.66
23 STIG10 STIG-10-16 HEAT	0.	193.	694.	92.	249.	73.	0.	-737.	694.	RESIDUAL	-42.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	12.	41.	9.	14.	4.	98.	0.	139.	RESIDUAL	139.	10	0.08	0.10	0.66
24 STIG1S STIG-1S-16 HEAT	0.	129.	436.	92.	146.	43.	0.	-415.	436.	RESIDUAL	22.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	15.	37.	8.	14.	4.	99.	0.	136.	RESIDUAL	136.	0	0.10	0.10	0.68
25 DEADV3 DIESEL-ADV HEAT	0.	178.	437.	92.	162.	48.	0.	-464.	437.	RESIDUAL	-27.	0	0.29	0.37	0.21
26 DEADV2 DIESEL-ADV POWR	0.	17.	37.	9.	14.	4.	97.	0.	134.	RESIDUAL	134.	1	0.11	0.10	0.69
26 DEADV2 DIESEL-ADV HEAT	0.	166.	362.	92.	134.	39.	0.	-377.	362.	RESIDUAL	-15.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	23.	37.	14.	14.	4.	91	0.	128.	RESIDUAL	128.	1	0.15	0.11	0.72
27 DEADV1 DIESEL-ADV HEAT	0.	146.	235.	92.	87.	26.	0.	-230.	235.	RESIDUAL	5.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	22.	41.	18.	14.	4.	87.	0.	129.	RESIDUAL	129.	0	0.15	0.11	0.72
28 DEHTPM ADV-DIESEL HEAT	0.	116.	214.	92.	71.	21.	0.	-180.	214.	RESIDUAL	35.	0	0.35	0.33	0.43
29 DESOA3 DIESEL-SOA POWR	0.	13.	38.	7.	14.	4.	100.	0.	138.	DISTILLA	138.	0	0.08	0.10	0.67
29 DESOA3 DIESEL-SOA HEAT	0.	175.	521.	92.	188.	55.	0.	-545.	521.	DISTILLA	-24.	0	0.25	0.36	0.18
29 DESOA3 DIESEL-SOA POWR	0.	13.	38.	7.	14.	4.	100.	0.	138.	RESIDUAL	138.	0	0.08	0.10	0.67
29 DESOA3 DIESEL-SOA HEAT	0.	175.	521.	92.	188.	55.	0.	-545.	521.	RESIDUAL	-24.	0	0.25	0.36	0.18

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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INDUSTRY 28741 MW 4.00 PROCESS MILLIONS BTU/HR 92.0 PROCESS TEMP(F) 353. PRODUCT PHOS-ACID+SU HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	15.	38.	8.	14.	4.	98.	0.	136.	DISTILLA	136.	1	0.10	0.10	0.68
30 DESOA2 DIESEL-SOA HEAT	0.	162.	418.	92.	151.	44.	0.	-429.	418.	DISTILLA	-11.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	15.	38.	8.	14.	4.	98.	0.	136.	RESIDUAL	136.	1	0.10	0.10	0.68
30 DESOA2 DIESEL-SOA HEAT	0.	162.	418.	92.	151.	44.	0.	-429.	418.	RESIDUAL	-11.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	23.	38.	15.	14.	4.	90.	0.	128.	DISTILLA	128.	1	0.15	0.11	0.72
31 DESOA1 DIESEL-SOA HEAT	0.	138.	229.	92.	83.	24.	0.	-216.	229.	DISTILLA	13.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	23.	38.	15.	14.	4.	90.	0.	128.	RESIDUAL	128.	1	0.15	0.11	0.72
31 DESOA1 DIESEL-SOA HEAT	0.	138.	229.	92.	83.	24.	0.	-216.	229.	RESIDUAL	13.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	21.	47.	22.	14.	4.	83.	0.	130.	DISTILLA	130.	10	0.14	0.11	0.71
32 GTSOAD GT-HRSG-10 HEAT	0.	91.	199.	92.	58.	17.	0.	-139.	199.	DISTILLA	60.	0	0.31	0.29	0.46
33 GTRA08 GT-85RE-08 POWR	0.	20.	38.	13.	14.	4.	93.	0.	131.	DISTILLA	131.	10	0.13	0.10	0.70
33 GTRA08 GT-85RE-08 HEAT	0.	139.	269.	92.	96.	28.	0.	-258.	269.	DISTILLA	12.	0	0.34	0.36	0.34
34 GTRA12 GT-85RE-12 POWR	0.	20.	38.	13.	14.	4.	93.	0.	131.	DISTILLA	131.	10	0.13	0.10	0.70
34 GTRA12 GT-85RE-12 HEAT	0.	139.	262.	92.	94.	28.	0.	-251.	262.	DISTILLA	12.	0	0.35	0.36	0.35
35 GTRA16 GT-85RE-16 POWR	0.	20.	39.	14.	14.	4.	91.	0.	130.	DISTILLA	130.	10	0.14	0.10	0.71
35 GTRA16 GT-85RE-16 HEAT	0.	131.	251.	92.	88.	26.	0.	-231.	251.	DISTILLA	20.	0	0.34	0.35	0.37
36 GTR208 GT-60RE-08 POWR	0.	20.	43.	17.	14.	4.	88.	0.	131.	DISTILLA	131.	10	0.13	0.10	0.70
36 GTR208 GT-60RE-08 HEAT	0.	108.	227.	92.	73.	21.	0.	-184.	227.	DISTILLA	43.	0	0.32	0.32	0.41
37 GTR212 GT-60RE-12 POWR	0.	20.	41.	16.	14.	4.	89.	0.	131.	DISTILLA	131.	10	0.13	0.10	0.70
37 GTR212 GT-60RE-12 HEAT	0.	116.	236.	92.	78.	23.	0.	-201.	236.	DISTILLA	35.	0	0.33	0.33	0.39
38 GTR216 GT-60RE-16 POWR	0.	21.	40.	16.	14.	4.	90.	0.	130.	DISTILLA	130.	10	0.14	0.10	0.71
38 GTR216 GT-60RE-16 HEAT	0.	121.	237.	92.	80.	23.	0.	-207.	237.	DISTILLA	30.	0	0.34	0.34	0.39
39 GTRW08 GT-85RE-08 POWR	0.	17.	39.	11.	14.	4.	95.	0.	134.	DISTILLA	134.	10	0.11	0.10	0.69
39 GTRW08 GT-85RE-08 HEAT	0.	140.	327.	92.	115.	34.	0.	-316.	327.	DISTILLA	11.	0	0.30	0.35	0.28
40 GTRW12 GT-85RE-12 POWR	0.	18.	37.	11.	14.	4.	96.	0.	133.	DISTILLA	133.	10	0.12	0.10	0.69
40 GTRW12 GT-85RE-12 HEAT	0.	152.	321.	92.	117.	34.	0.	-322.	321.	DISTILLA	-1.	0	0.32	0.36	0.29

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

183E PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28741 MW 4.00 PROCESS MILLIONS BTU/HR 92.0 PROCESS TEMP(F) 353 PRODUCT PHOS-ACID+SU HOURS PER YEAR 7900

POWER TO HEAT RATIO 0.148

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	18.	38.	12.	14.	4.	95.	0.	133.	DISTILLA	133.	10	0.12	0.10	0.69
41 GTRW16 GT-85RE-16 HEAT	0.	143.	303.	92.	108.	32.	0.	-296.	303.	DISTILLA	8.	0	0.32	0.36	0.30
42 GTR308 GT-60RE-08 POWR	0.	15.	44.	14.	14.	4.	91.	0.	135.	DISTILLA	135.	10	0.10	0.10	0.68
42 GTR308 GT-60RE-08 HEAT	0.	99.	283.	92.	88.	26.	0.	-231.	283.	DISTILLA	51.	0	0.26	0.31	0.33
43 GTR312 GT-60RE-12 POWR	0.	18.	40.	13.	14.	4.	93.	0.	133.	DISTILLA	133.	10	0.12	0.10	0.69
43 GTR312 GT-60RE-12 HEAT	0.	127.	276.	92.	94.	28.	0.	-252.	276.	DISTILLA	24.	0	0.32	0.34	0.33
44 GTR316 GT-60RE-16 POWR	0.	18.	40.	14.	14.	4.	92.	0.	133.	DISTILLA	133.	10	0.12	0.10	0.69
44 GTR316 GT-60RE-16 HEAT	0.	125.	274.	92.	93.	27.	0.	-248.	274.	DISTILLA	26.	0	0.31	0.34	0.34
45 FCPADS FUEL-CL-PH POWR	0.	14.	36.	6.	14.	4.	101.	0.	137.	DISTILLA	137.	0	0.09	0.10	0.67
45 FCPADS FUEL-CL-PH HEAT	0.	210.	541.	92.	206.	60.	0.	-600.	541.	DISTILLA	-59.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	19.	33.	8.	14.	4.	99.	0.	132.	DISTILLA	132.	10	0.12	0.10	0.70
46 FCMCDS FUEL-CL-MO HEAT	0.	222.	395.	92.	163.	48.	0.	-466.	395.	DISTILLA	-71.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28951 MW 4.00 PROCESS MILLIONS BTU/HR 20.0 PROCESS TEMP(F) 298. PRODUCT CARBON-BLACK HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.682

UTILITY FUEL COAL WASTE FUEL EGV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	24.	43.	24.	RESIDUAL	68.	0	0.	0.21	0.30
1 STM141 STM-TURB-1 POWR	0.	-14.	81.	55.	14.	4.	-41.	0.	81.	RESIDUAL	81.	10	-0.22	0.17	0.25
1 STM141 STM-TURB-1 HEAT	0.	10.	29.	20.	5.	1.	0.	27.	29.	RESIDUAL	56.	10	0.15	0.09	0.35
1 STM141 STM-TURB-1 POWR	0.	-14.	81.	55.	14.	4.	-41.	0.	81.	COAL-FGD	81.	10	-0.22	0.17	0.25
1 STM141 STM-TURB-1 HEAT	0.	10.	29.	20.	5.	1.	0.	27.	29.	COAL-FGD	56.	10	0.15	0.09	0.35
1 STM141 STM-TURB-1 POWR	0.	-14.	81.	55.	14.	4.	-41.	0.	81.	COAL-AFB	81.	10	-0.22	0.17	0.25
1 STM141 STM-TURB-1 HEAT	0.	10.	29.	20.	5.	1.	0.	27.	29.	COAL-AFB	56.	10	0.15	0.09	0.35
2 STM088 STM-TURB-8 POWR	0.	-35.	101.	72.	14.	4.	-61.	0.	101.	RESIDUAL	101.	10	-0.52	0.14	0.20
2 STM088 STM-TURB-8 HEAT	0.	7.	28.	20.	4.	1.	0.	31.	28.	RESIDUAL	59.	10	0.11	0.06	0.34
2 STM088 STM-TURB-8 POWR	0.	-35.	101.	72.	14.	4.	-61.	0.	101.	COAL-FGD	101.	10	-0.52	0.14	0.20
2 STM088 STM-TURB-8 HEAT	0.	7.	28.	20.	4.	1.	0.	31.	28.	COAL-FGD	59.	10	0.11	0.06	0.34
2 STM088 STM-TURB-8 POWR	0.	-35.	101.	72.	14.	4.	-61.	0.	101.	COAL-AFB	101.	10	-0.52	0.14	0.20
2 STM088 STM-TURB-8 HEAT	0.	7.	28.	20.	4.	1.	0.	31.	28.	COAL-AFB	59.	10	0.11	0.06	0.34
3 PFBSTM PFB-STMTB- POWR	0.	8.	59.	36.	14.	4.	-19.	0.	59.	COAL-PFB	59.	10	0.11	0.23	0.34
3 PFBSTM PFB-STMTB- HEAT	0.	15.	33.	20.	8.	2.	0.	19.	33.	COAL-PFB	52.	10	0.22	0.15	0.39
4 TISTMT TI-STMTB-1 POWR	0.	18.	49.	27.	14.	4.	-9.	0.	49.	RESIDUAL	49.	10	0.26	0.28	0.41
4 TISTMT TI-STMTB-1 HEAT	0.	19.	36.	20.	10.	3.	0.	11.	36.	RESIDUAL	47.	10	0.29	0.21	0.43
4 TISTMT TI-STMTB-1 POWR	0.	18.	49.	27.	14.	4.	-9.	0.	49.	COAL	49.	10	0.26	0.28	0.41
4 TISTMT TI-STMTB-1 HEAT	0.	19.	36.	20.	10.	3.	0.	11.	36.	COAL	47.	10	0.29	0.21	0.43
5 TIHRSG THERMIONIC POWR	0.	-31.	97.	65.	14.	4.	-53.	0.	97.	RESIDUAL	97.	0	-0.47	0.14	0.21
5 TIHRSG THERMIONIC HEAT	0.	7.	30.	20.	4.	1.	0.	29.	30.	RESIDUAL	59.	10	0.10	0.07	0.34
5 TIHRSG THERMIONIC POWR	0.	-31.	97.	65.	14.	4.	-53.	0.	97.	COAL	97.	0	-0.47	0.14	0.21
5 TIHRSG THERMIONIC HEAT	0.	7.	30.	20.	4.	1.	0.	29.	30.	COAL	59.	10	0.10	0.07	0.34
6 STIRL STIRLING-1 POWR	0.	15.	51.	24.	14.	4.	-4.	0.	51.	DISTILLA	51.	0	0.23	0.27	0.39
6 STIRL STIRLING-1 HEAT	0.	16.	43.	20.	12.	3.	0.	7.	43.	DISTILLA	50.	0	0.25	0.23	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28951 MW 4.00 PROCESS MILLIONS BTU/HR 20.0 PROCESS TEMP(F) 298. PRODUCT CARBON-BLACK HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.682

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	15.	51.	24.	14.	4.	-4.	0.	51.	RESIDUAL	51.	0	0.23	0 27	0.39
6	STIRL	STIRLING-1	HEAT	0.	16.	43.	20.	12.	3.	0.	7.	43.	RESIDUAL	50.	0	0.25	0.23	0.40
6	STIRL	STIRLING-1	POWR	0.	15.	51.	24.	14.	4.	-4.	0.	51.	COAL	51.	0	0.23	0.27	0.39
6	STIRL	STIRLING-1	HEAT	0.	16.	43.	20.	12.	3.	0.	7.	43.	COAL	50.	0	0.25	0.23	0.40
7	HEGT85	HELIUM-GT-	POWR	0.	11.	43.	9.	14.	4.	13.	0.	55.	COAL-AFB	55.	10	0.16	0.25	0.36
7	HEGT85	HELIUM-GT-	HEAT	0.	24.	94.	20.	30.	9.	0.	-51.	94.	COAL-AFB	42.	10	0.20	0.32	0.21
8	HEGT60	HELIUM-GT-	POWR	0.	12.	53.	18.	14.	4.	2.	0.	55.	COAL-AFB	55.	10	0.17	0.25	0.37
8	HEGT60	HELIUM-GT-	HEAT	0.	13.	57.	20.	15.	4.	0.	-4.	57.	COAL-AFB	54.	10	0.18	0.26	0.35
9	HEGT00	HELIUM-GT-	POWR	0.	-11.	78.	39.	14.	4.	-23.	0.	78.	COAL-AFB	78.	10	-0.17	0.18	0.26
9	HEGT00	HELIUM-GT-	HEAT	0.	6.	40.	20.	7.	2.	0.	21.	40.	COAL-AFB	60.	10	0.09	0.12	0.33
10	FCMCCL	FUEL-CL-MO	POWR	0.	21.	45.	21.	14.	4.	-2.	0.	45.	COAL	45.	10	0.32	0.30	0.45
10	FCMCCL	FUEL-CL-MO	HEAT	0.	21.	42.	20.	13.	4.	0.	3.	42.	COAL	45.	10	0.32	0.29	0.45
11	FCSTCL	FUEL-CL-ST	POWR	0.	24.	34.	13.	14.	4.	8.	0.	42.	COAL	42.	10	0.36	0.32	0.47
11	FCSTCL	FUEL-CL-ST	HEAT	0.	36.	52.	20.	21.	6.	0.	-23.	52.	COAL	30.	10	0.41	0.40	0.38
12	IGGTST	INT-GAS-GT	POWR	0.	19.	45.	19.	14.	4.	2.	0.	47.	COAL	47.	10	0.29	0.29	0.43
12	IGGTST	INT-GAS-GT	HEAT	0.	21.	49.	20.	15.	4.	0.	-3.	49.	COAL	46.	10	0.30	0.30	0.41
13	GTSOAR	GT-HRSG-10	POWR	0.	19.	47.	21.	14.	4.	-1.	0.	47.	RESIDUAL	47.	10	0.29	0.29	0.42
13	GTSOAR	GT-HRSG-10	HEAT	0.	19.	45.	20.	13.	4.	0.	2.	45.	RESIDUAL	47.	10	0.29	0.28	0.43
14	GTAC08	GT-HRSG-08	POWR	0.	16.	51.	26.	14.	4.	-7.	0.	51.	RESIDUAL	51.	10	0.24	0.27	0.40
14	GTAC08	GT-HRSG-08	HEAT	0.	17.	39.	20.	11.	3.	0.	10.	39.	RESIDUAL	49.	10	0.26	0.22	0.41
15	GTAC12	GT-HRSG-12	POWR	0.	21.	45.	21.	14.	4.	-1.	0.	45.	RESIDUAL	45.	10	0.32	0.31	0.45
15	GTAC12	GT-HRSG-12	HEAT	0.	22.	43.	20.	13.	4.	0.	2.	43.	RESIDUAL	45.	10	0.33	0.29	0.45
16	GTAC16	GT-HRSG-16	POWR	0.	22.	42.	19.	14.	4.	2.	0.	44.	RESIDUAL	44.	10	0.34	0.31	0.46
16	GTAC16	GT-HRSG-16	HEAT	0.	24.	45.	20.	15.	4.	0.	-3.	45.	RESIDUAL	42.	10	0.35	0.32	0.44
17	GTWC16	GT-HRSG-16	POWR	0.	20.	43.	18.	14.	4.	3.	0.	46.	RESIDUAL	46.	10	0.30	0.29	0.43
17	GTWC16	GT-HRSG-16	HEAT	0.	23.	50.	20.	16.	5.	0.	-6.	50.	RESIDUAL	43.	10	0.31	0.32	0.40

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28951 MW 4.00 PROCESS MILLIONS BTU/HR 20.0 PROCESS TEMP(F) 298. PRODUCT CARBON-BLACK HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.682

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	20.	35.	10.	14.	4.	11.	0.	46.	RESIDUAL	46.	10	0.30	0.29	0.43
18 CC1626 GTST-16/26 HEAT	0.	38.	67.	20.	26.	8.	0.	-39.	67.	RESIDUAL	28.	10	0.36	0.39	0.30
19 CC1622 GTST-16/22 POWR	0.	21.	35.	12.	14.	4.	10.	0.	45.	RESIDUAL	45.	10	0.32	0.30	0.44
19 CC1622 GTST-16/22 HEAT	0.	36.	61.	20.	24.	7.	0.	-31.	61.	RESIDUAL	30.	10	0.37	0.39	0.33
20 CC1222 GTST-12/22 POWR	0.	21.	35.	12.	14.	4.	10.	0.	45.	RESIDUAL	45.	10	0.32	0.30	0.44
20 CC1222 GTST-12/22 HEAT	0.	36.	61.	20.	23.	7.	0.	-31.	61.	RESIDUAL	30.	10	0.37	0.39	0.33
21 CC0822 GTST-08/22 POWR	0.	23.	37.	15.	14.	4.	6.	0.	44.	RESIDUAL	44.	10	0.34	0.31	0.46
21 CC0822 GTST-08/22 HEAT	0.	31.	51.	20.	19.	6.	0.	-16.	51.	RESIDUAL	35.	10	0.38	0.37	0.39
22 STIG15 STIG-15-16 POWR	0.	7.	36.	0.	14.	4.	23.	0.	59.	RESIDUAL	59.	10	0.11	0.23	0.34
22 STIG15 STIG-15-16 HEAT	0.	317.	1538.	20.	586.	172.	0.	-1789.	1538.	RESIDUAL	-251.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	11.	38.	5.	14.	4.	18.	0.	56.	RESIDUAL	56.	10	0.16	0.25	0.36
23 STIG10 STIG-10-16 HEAT	0.	42.	151.	20.	54.	16.	0.	-127.	151.	RESIDUAL	24.	10	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	12.	41.	9.	14.	4.	13.	0.	54.	RESIDUAL	54.	10	0.18	0.25	0.37
24 STIG1S STIG-1S-16 HEAT	0.	28.	95.	20.	32.	9.	0.	-57.	95.	RESIDUAL	38.	10	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	16.	37.	9.	14.	4.	13.	0.	50.	RESIDUAL	50.	0	0.24	0.27	0.40
25 DEADV3 DIESEL-ADV HEAT	0.	37.	86.	20.	32.	9.	0.	-57.	86.	RESIDUAL	29.	0	0.30	0.37	0.23
26 DEADV2 DIESEL-ADV POWR	0.	17.	37.	9.	14.	4.	13.	0.	49.	RESIDUAL	49.	1	0.25	0.28	0.41
26 DEADV2 DIESEL-ADV HEAT	0.	36.	79.	20.	29.	9.	0.	-49.	79.	RESIDUAL	30.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	23.	37.	14.	14.	4.	7.	0.	43.	RESIDUAL	43.	1	0.34	0.31	0.46
27 DEADV1 DIESEL-ADV HEAT	0.	32.	51.	20.	19.	6.	0.	-17.	51.	RESIDUAL	34.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	24.	39.	17.	14.	4.	4.	0.	43.	RESIDUAL	43.	0	0.36	0.32	0.47
28 DEHTPM ADV-DIESEL HEAT	0.	28.	46.	20.	16.	5.	0.	-8.	46.	RESIDUAL	38.	0	0.38	0.35	0.43
29 DESOA3 DIESEL-SOA POWR	0.	14.	38.	8.	14.	4.	15.	0.	52.	DISTILLA	52.	0	0.21	0.26	0.38
29 DESOA3 DIESEL-SOA HEAT	0.	36.	100.	20.	36.	11.	0.	-70.	100.	DISTILLA	30.	0	0.27	0.36	0.20
29 DESOA3 DIESEL-SOA POWR	0.	14.	38.	8.	14.	4.	15.	0.	52.	RESIDUAL	52.	0	0.21	0.26	0.38
29 DESOA3 DIESEL-SOA HEAT	0.	36.	100.	20.	36.	11.	0.	-70.	100.	RESIDUAL	30.	0	0.27	0.36	0.20

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28951 MW 4.00 PROCESS MILLIONS BTU/HR 20.0 PROCESS TEMP(F) 298. PRODUCT CARBON-BLACK HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.682

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2	DIESEL-SOA	POWR	0.	15.	38.	8.	14.	4.	14.	0.	52.	DISTILLA	52.	1	0.22	0.26	0.39
30 DESOA2	DIESEL-SOA	HEAT	0.	35.	91.	20.	33.	10.	0.	-60.	91.	DISTILLA	31.	1	0.28	0.36	0.22
30 DESOA2	DIESEL-SOA	POWR	0.	15.	38.	8.	14.	4.	14.	0.	52.	RESIDUAL	52.	1	0.22	0.26	0.39
30 DESOA2	DIESEL-SOA	HEAT	0.	35.	91.	20.	33.	10.	0.	-60.	91.	RESIDUAL	31.	1	0.28	0.36	0.22
31 DESOA1	DIESEL-SOA	POWR	0.	23.	38.	15.	14.	4.	6.	0.	43.	DISTILLA	43.	1	0.34	0.31	0.46
31 DESOA1	DIESEL-SOA	HEAT	0.	30.	50.	20.	18.	5.	0.	-14.	50.	DISTILLA	36.	1	0.37	0.36	0.40
31 DESOA1	DIESEL-SOA	POWR	0.	23.	38.	15.	14.	4.	6.	0.	43.	RESIDUAL	43.	1	0.34	0.31	0.46
31 DESOA1	DIESEL-SOA	HEAT	0.	30.	50.	20.	18.	5.	0.	-14.	50.	RESIDUAL	36.	1	0.37	0.36	0.40
32 GTSOAD	GT-HRSG-10	POWR	0.	19.	47.	22.	14.	4.	-2.	0.	47.	DISTILLA	47.	10	0.29	0.29	0.43
32 GTSOAD	GT-HRSG-10	HEAT	0.	20.	43.	20.	12.	4.	0.	4.	43.	DISTILLA	46.	10	0.30	0.27	0.43
33 GTRA08	GT-85RE-08	POWR	0.	21.	38.	14.	14.	4.	7.	0.	45.	DISTILLA	45.	10	0.31	0.30	0.41
33 GTRA08	GT-85RE-08	HEAT	0.	30.	55.	20.	20.	6.	0.	-19.	55.	DISTILLA	36.	10	0.35	0.36	0.36
34 GTRA12	GT-85RE-12	POWR	0.	21.	38.	14.	14.	4.	7.	0.	45.	DISTILLA	45.	10	0.32	0.30	0.44
34 GTRA12	GT-85RE-12	HEAT	0.	30.	54.	20.	19.	6.	0.	-18.	54.	DISTILLA	36.	10	0.36	0.36	0.37
35 GTRA16	GT-85RE-16	POWR	0.	21.	39.	15.	14.	4	6.	0.	45.	DISTILLA	45.	10	0.32	0.30	[illegible]
35 GTRA16	GT-85RE-16	HEAT	0.	28.	52.	20.	18.	5.	0.	-14.	52.	DISTILLA	38.	10	0.35	0.35	[illegible]
36 GTR208	GT-60RE-08	POWR	0.	21.	43.	18.	14.	4.	3.	0.	45.	DISTILLA	45.	10	0.32	0.30	0.44
36 GTR208	GT-60RE-08	HEAT	0.	24.	48.	20.	15.	4.	0.	-5.	48.	DISTILLA	43.	10	0.33	0.32	0.42
37 GTR212	GT-60RE-12	POWR	0.	21.	41.	17.	14.	4.	4.	0.	45.	DISTILLA	45.	10	0.31	0.30	0.44
37 GTR212	GT-60RE-12	HEAT	0.	25.	50.	20.	16.	5.	0.	-9.	50.	DISTILLA	[illegible]	10	0.33	0.33	0.40
38 GTR216	GT-60RE-16	POWR	0.	21.	40.	16.	14.	4.	4.	0.	45.	DISTILLA	45.	10	0.32	0.30	0.45
38 GTR216	GT-60RE-16	HEAT	0.	26.	50.	20.	17.	5.	0.	-10.	50.	DISTILLA	40.	10	0.34	0.34	0.40
39 GTRW08	GT-85PE-08	POWR	0.	17.	39.	12.	14.	4.	10.	0.	49.	DISTILLA	49.	10	0.26	0.28	0.41
39 GTRW08	GT-85PE-08	HEAT	0.	30.	67.	20.	24.	7.	0.	-31.	67.	DISTILLA	36.	10	0.31	0.35	0.30
40 GTRW12	GT-85PE-12	POWR	0.	18.	37.	11.	14.	4.	10.	0.	48.	DISTILLA	48.	10	0.28	0.29	0.42
40 GTRW12	GT-85RE-12	HEAT	0.	33.	67.	20.	24.	7.	0.	-33.	67.	DISTILLA	33.	10	0.33	0.36	0.30

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 28951 MW 4.00 PROCESS MILLIONS BTU/HR 20.0 PROCESS TEMP(F) 298. PRODUCT CARBON-BLACK HOURS PER YEAR 7900.

POWER TO HEAT RATIO 0.682

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	19.	38.	12.	14.	4.	9.	0.	48.	DISTILLA	48.	10	0.28	0.29	0.42
41 GTRW16 GT-85RE-16 HEAT	0.	31.	64.	20.	23.	7.	0.	-28.	64.	DISTILLA	35.	10	0.33	0.36	0.31
42 GTR308 GT-60RE-08 POWR	0.	16.	44.	15.	14.	4.	6.	0.	50.	DISTILLA	50.	10	0.25	0.27	0.40
42 GTR308 GT-60RE-08 HEAT	0.	22.	58.	20.	18.	5.	0.	-14.	58.	DISTILLA	44.	10	0.27	0.31	0.34
43 GTR312 GT-60RE-12 POWR	0.	19.	40.	14.	14.	4.	8.	0.	47.	DISTILLA	47.	10	0.28	0.29	0.42
43 GTR312 GT-60RE-12 HEAT	0.	28.	59.	20.	20.	6.	0.	-20.	59.	DISTILLA	39.	10	0.32	0.34	0.34
44 GTR316 GT-60RE-16 POWR	0.	19.	40.	14.	14.	4.	7.	0.	48.	DISTILLA	48.	10	0.28	0.29	0.42
44 GTR316 GT-60RE-16 HEAT	0.	27.	58.	20	20.	6.	0.	-19.	58.	DISTILLA	39.	10	0.32	0.34	0.34
45 FCPADS FUEL-CL-PH POWR	0.	14.	36.	6.	14.	4.	16.	0.	52.	DISTILLA	52.	0	0.21	0.26	0.38
45 FCPADS FUEL-CL-PH HEAT	0.	46.	118.	20.	45.	13.	0.	-97.	118.	DISTILLA	21.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	19.	33.	8.	14.	4.	14.	0.	48.	DISTILLA	48.	10	0.28	0.29	0.42
46 FCMCDS FUEL-CL-MO HEAT	0.	48.	86.	20.	35.	10.	0.	-68.	86.	DISTILLA	18.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29111 MW 14.00 PROCESS MILLIONS BTU/HR 375.0 PROCESS TEMP(F) 470. PRODUCT SMALL-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.127

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	441.	149.	441.	COAL-FGD	590.	0	0.	0.C8	0.64
1 STM141 STM-TURB-1 POWR	0.	93.	407.	299.	48.	14.	90.	0.	497.	RESIDUAL	497.	0	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	117.	512.	375.	60.	18.	0.	-38.	512.	RESIDUAL	474.	0	0.19	0.12	0.73
1 STM141 STM-TURB-1 POWR	0.	93.	407.	299.	48.	14.	90.	0.	497.	COAL-FGD	497.	0	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	117.	512.	375.	60.	18.	0.	-38.	512.	COAL-FGD	474.	0	0.19	0.12	0.73
1 STM141 STM-TURB-1 POWR	0.	93.	407.	299.	48.	14.	90.	0.	497.	COAL-AFB	497.	0	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	117.	512.	375.	60.	18.	0.	-38.	512.	COAL-AFB	474.	0	0.19	0.12	0.73
2 STM088 STM-TURB-8 POWR	0.	7.	583.	448.	48.	14.	-86.	0.	583.	RESIDUAL	583.	0	0.01	0.08	0.64
2 STM088 STM-TURB-8 HEAT	0.	78.	488.	375.	40.	12.	0.	24.	488.	RESIDUAL	512.	0	0.13	0.08	0.73
2 STM088 STM-TURB-8 POWR	0.	7.	583.	448.	48.	14.	-86.	0.	583.	COAL-FGD	583.	0	0.01	0.08	0.64
2 STM088 STM-TURB-8 HEAT	0.	78.	488.	375.	40.	12.	0.	24.	488.	COAL-FGD	512.	0	0.13	0.08	0.73
2 STM088 STM-TURB-8 POWR	0.	7.	583.	448.	48.	14.	-86.	0.	583.	COAL-AFB	583.	0	0.01	0.08	0.64
2 STM088 STM-TURB-8 HEAT	0.	78.	488.	375.	40.	12.	0.	24.	488.	COAL-AFB	512.	0	0.13	0.08	0.73
3 PFBSTM PFB-STMTB- POWR	0.	90.	256.	167.	48.	14.	244.	0.	500.	COAL-PFB	500.	0	0.15	0.10	0.75
3 PFBSTM PFB-STMTB- HEAT	0.	203.	573.	375.	107.	31.	0.	-185.	573.	COAL-PFB	388.	0	0.26	0.19	0.65
4 TISTMT TI-STMTB-1 POWR	0.	91.	201.	122.	48.	14.	298.	0.	499.	RESIDUAL	499.	0	0.15	0.10	0.75
4 TISTMT TI-STMTB-1 HEAT	0.	281.	619.	375.	147.	43.	0.	-310.	619.	RESIDUAL	309.	0	0.31	0.24	0.61
4 TISTMT TI-STMTB-1 POWR	0.	91.	201.	122.	48.	14.	298.	0.	499.	COAL	499.	0	0.15	0.10	0.75
4 TISTMT TI-STMTB-1 HEAT	0.	281.	619.	375.	147.	43.	0.	-310.	619.	COAL	309.	0	0.31	0.24	0.61
5 TIHRSG THERMIONIC POWR	0.	52.	340.	206.	48.	14.	199.	0.	539.	RESIDUAL	539.	0	0.09	0.09	0.70
5 TIHRSG THERMIONIC HEAT	0.	94.	619.	375.	87.	26.	0.	-123.	619.	RESIDUAL	496.	0	0.13	0.14	0.61
5 TIHRSG THERMIONIC POWR	0.	52.	340.	206.	48.	14.	199.	0.	539.	COAL	539.	0	0.09	0.09	0.70
5 TIHRSG THERMIONIC HEAT	0.	94.	619.	375.	87.	26.	0.	-123.	619.	COAL	496.	0	0.13	0.14	0.61
6 STIRL STIRLING-1 POWR	0.	63.	213.	107.	48.	14.	315.	0.	528.	DISTILLA	528.	0	0.11	0.09	0.71
6 STIRL STIRLING-1 HEAT	0.	219.	744.	375.	167.	49.	0.	-373.	744.	DISTILLA	371.	0	0.23	0.22	0.50

HONEYWELL PAGE PRINTING SYSTEM - P1185-02

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29111 MW 14.00 PROCESS MILLIONS BTU/HR 375.0 PROCESS TEMP(F) 470. PRODUCT SMALL-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.127

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	63.	213.	107.	48.	14.	315.	0.	528.	RESIDUAL	528.	0	0.11	0.09	0.71
6	STIRL	STIRLING-1	HEAT	0.	219.	744.	375.	167.	49.	0.	-373.	744.	RESIDUAL	371.	0	0.23	0.22	0.50
6	STIRL	STIRLING-1	POWR	0.	63.	213.	107.	48.	14.	315.	0.	528.	COAL	528.	0	0.11	0.09	0.71
6	STIRL	STIRLING-1	HEAT	0.	219.	744.	375.	167.	49.	0.	-373.	744.	COAL	371.	0	0.23	0.22	0.50
7	HEGT85	HELIUM-GT-	POWR	0.	-10.	149.	-9.	48.	14.	451.	0.	600.	COAL-AFB	600.	11	-0.02	0.08	0.62
7	HEGT85	HELIUM-GT-	HEAT	-6413.	421.	-6413.	375.	-2059.	-603.	0.	6582.	-6413.	COAL-AFB	169.	11	*****	*****	2.21
8	HEGT60	HELIUM-GT-	POWR	0.	3.	184.	32.	48.	14.	403.	0.	588.	COAL-AFB	588.	10	0.00	0.08	0.64
8	HEGT60	HELIUM-GT-	HEAT	0.	32.	2144.	375.	555.	163.	0.	-1586.	2144.	COAL-AFB	558.	0	0.01	0.26	0.17
9	HEGT00	HELIUM-GT-	POWR	0.	27.	271.	127.	48.	14.	292.	0.	564.	COAL-AFB	564.	10	0.05	0.08	0.67
9	HEGT00	HELIUM-GT-	HEAT	0.	79.	804.	375.	141.	41.	0.	-293.	804.	COAL-AFB	511.	10	0.09	0.18	0.47
10	FCMCCL	FUEL-CL-MO	POWR	0.	79.	157.	74.	48.	14.	354.	0.	511.	COAL	511.	10	0.13	0.09	0.73
10	FCMCCL	FUEL-CL-MO	HEAT	0.	401.	797.	375.	242.	71.	0.	-608.	797.	COAL	189.	10	0.34	0.30	0.47
11	FCSTCL	FUEL-CL-ST	POWR	0.	82.	129.	53.	48.	14.	379.	0.	508.	COAL	508.	10	0.14	0.09	0.74
11	FCSTCL	FUEL-CL-ST	HEAT	0.	582.	915.	375.	338.	99.	0.	-907.	915.	COAL	8.	10	0.39	0.37	0.41
12	IGGTST	INT-GAS-GT	POWR	0.	64.	177.	78.	48.	14.	350.	0.	527.	COAL	527.	10	0.11	0.09	0.71
12	IGGTST	INT-GAS-GT	HEAT	0.	308.	852.	375.	230.	67.	0.	-570.	852.	COAL	282.	10	0.27	0.27	0.44
13	GTSOAR	GT-HRSG-10	POWR	0.	60.	165.	64.	48.	14.	366.	0.	530.	RESIDUAL	530	0	0.10	0.09	0.71
13	GTSOAR	GT-HRSG-10	HEAT	0.	351.	963.	375.	279.	82.	0.	-723.	963.	RESIDUAL	240.	0	0.27	0.29	0.39
14	GTAC08	GT-HRSG-08	POWR	0.	80.	177.	91.	48.	14.	334.	0.	511.	RESIDUAL	511.	0	0.14	0.09	0.73
14	GTAC08	GT-HRSG-08	HEAT	0.	328.	727.	375.	196.	58.	0.	-464.	727.	RESIDUAL	263.	0	0.31	0.27	0.52
15	GTAC12	GT-HRSG-12	POWR	0.	78.	157.	73.	48.	14.	356.	0.	512.	RESIDUAL	512.	0	0.13	0.09	0.73
15	GTAC12	GT-HRSG-12	HEAT	0.	403.	810.	375.	247.	72.	0.	-623.	810.	RESIDUAL	187.	0	0.33	0.31	0.46
16	GTAC16	GT-HRSG-16	POWR	0.	75.	148.	62.	48.	14.	368.	0.	516.	RESIDUAL	516.	0	0.13	0.09	0.73
16	GTAC16	GT-HRSG-16	HEAT	0.	450.	888.	375.	287.	84.	0.	-747.	888.	RESIDUAL	141.	0	0.34	0.32	0.42
17	GTWC16	GT-HRSG-16	POWR	0.	70.	152.	61.	48.	14.	369.	0.	520.	RESIDUAL	520.	10	0.12	0.09	0.72
17	GTWC16	GT-HRSG-16	HEAT	0.	427.	925.	375.	291.	85.	0.	-761.	925.	RESIDUAL	164.	0	0.32	0.32	0.41

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29111 MW 14.00 PROCESS MILLIONS BTU/HR 375.0 PROCESS TEMP(F) 470. PRODUCT SMALL-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.127

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	68.	130.	42.	48.	14.	392.	0.	522.	RESIDUAL	522.	10	0.12	0.09	0.72
18 CC1626 GTST-16/26 HEAT	0.	612.	1168.	375.	428.	126.	0.	-1190.	1168.	RESIDUAL	-21.	0	0.34	0.37	0.32
19 CC1622 GTST-16/22 POWR	0.	72.	132.	47.	48.	14.	386.	0.	519.	RESIDUAL	519.	10	0.12	0.09	0.72
19 CC1622 GTST-16/22 HEAT	0.	577.	1066.	375.	385.	113.	0.	-1053.	1066.	RESIDUAL	14.	0	0.35	0.36	0.35
20 CC1222 GTST-12/22 POWR	0.	72.	132.	47.	48.	14.	386.	0.	518.	RESIDUAL	518.	0	0.12	0.09	0.72
20 CC1222 GTST-12/22 HEAT	0.	578.	1057.	375.	382.	112.	0.	-1044.	1057.	RESIDUAL	12.	0	0.35	0.36	0.35
21 CC0822 GTST-08/22 POWR	0.	78.	142.	60.	48.	14.	371.	0.	513.	RESIDUAL	513.	0	0.13	0.09	0.73
21 CC0822 GTST-08/22 HEAT	0.	489.	893.	375.	301.	88.	0.	-791.	893.	RESIDUAL	102.	0	0.35	0.34	0.42
22 STIG15 STIG-15-16 POWR	0.	26.	125.	2.	48.	14.	439.	0.	565.	RESIDUAL	565.	11	0.04	0.08	0.66
22 STIG15 STIG-15-16 HEAT	0.	5940.	28846.	375.	10990.	3221.	0.	-34196.	28846.	RESIDUAL	-5350.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	37.	133.	18.	48.	14.	420.	0.	553.	RESIDUAL	553.	11	0.06	0.09	0.68
23 STIG10 STIG-10-16 HEAT	0.	787.	2830.	375.	1016.	298.	0.	-3027.	2830.	RESIDUAL	-197.	1	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	42.	143.	30.	48.	14.	406.	0.	548.	RESIDUAL	548.	11	0.07	0.09	0.68
24 STIG1S STIG-1S-16 HEAT	0.	526.	1779.	375.	596.	175.	0.	-1714.	1779.	RESIDUAL	65.	1	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	45.	129.	21.	48.	14.	417.	0.	546.	RESIDUAL	546.	1	0.08	0.09	0.69
25 DEADV3 DIESEL-ADV HEAT	0.	812.	2329.	375	864.	253.	0.	-2551.	2329.	RESIDUAL	-222.	1	0.26	0.37	0.16
26 DEADV2 DIESEL-ADV POWR	0.	59.	129.	33.	48.	14.	403.	0.	531.	RESIDUAL	531.	1	0.10	0.09	0.71
26 DEADV2 DIESEL-ADV HEAT	0.	676.	1476.	375.	548.	161.	0.	-1562.	1476.	RESIDUAL	-86.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	80.	129.	50.	48.	14.	382.	0.	511.	RESIDUAL	511.	1	0.14	0.09	0.73
27 DEADV1 DIESEL-ADV HEAT	0.	594.	959.	375.	356.	104.	0.	-963.	959.	RESIDUAL	-4.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	65.	170.	73.	48.	14.	355.	0.	525.	RESIDUAL	525.	0	0.11	0.09	0.71
28 DEHTPM ADV-DIESEL HEAT	0.	336.	872.	375.	246.	72.	0.	-618.	872.	RESIDUAL	254.	0	0.28	0.28	0.43
29 DESOA3 DIESEL-SOA POWR	0.	37.	132.	17.	48.	14.	421.	0.	554.	DISTILLA	554.	1	0.06	0.09	0.68
29 DESOA3 DIESEL-SOA HEAT	0.	820.	2953.	375.	1066.	312.	0.	-3182.	2953.	DISTILLA	-229.	1	0.22	0.36	0.13
29 DESOA3 DIESEL-SOA POWR	0.	37.	132.	17.	48.	14.	421.	0.	554.	RESIDUAL	554.	1	0.06	0.09	0.68
29 DESOA3 DIESEL-SOA HEAT	0.	820.	2953.	375.	1066.	312.	0.	-3182.	2953.	RESIDUAL	-229.	1	0.22	0.36	0.13

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29111 MW 14.00 PROCESS MILLIONS BTU/HR 375.0 PROCESS TEMP(F) 470. PRODUCT SMALL-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.127

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESO[illegible] DIESEL-SOA POWR	0.	51.	132.	29.	48.	14.	407.	0.	539.	DISTILLA	539.	1	0.09	0.09	0.70
30 DESOA2 DIESEL-SOA HEAT	0.	660.	1705.	375.	615.	180.	0.	-1774.	1705.	DISTILLA	-69.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	51.	132.	29.	48.	14.	407.	0.	539.	RESIDUAL	539.	1	0.09	0.09	0.70
30 DESOA2 DIESEL-SOA HEAT	0.	660.	1705.	375.	615.	180.	0.	-1774.	1705.	RESIDUAL	-69.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	79.	132.	53.	48.	14.	379.	0.	511.	DISTILLA	511.	1	0.13	0.09	0.73
31 DESOA1 DIESEL-SOA HEAT	0.	561.	935.	375.	338.	99.	0.	-906.	935.	DISTILLA	29.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	79.	132.	53.	48.	14.	379.	0.	511.	RESIDUAL	511.	1	0.13	0.09	0.73
31 DESOA1 DIESEL-SOA HEAT	0.	561.	935.	375.	338.	99.	0.	-906.	935.	RESIDUAL	29.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	73.	164.	74.	48.	14.	354.	0.	517.	DISTILLA	517.	0	0.12	0.09	0.72
32 GTSOAD GT-HRSG-10 HEAT	0.	369.	826.	375.	241.	71.	0.	-605.	826.	DISTILLA	222.	0	0.31	0.29	0.45
33 GTRA08 GT-85RE-08 POWR	0.	60.	134.	38.	48.	14.	396.	0.	530	DISTILLA	530.	0	0.10	0.09	0.71
33 GTRA08 GT-85RE-08 HEAT	0.	593.	1316.	375.	470.	138.	0.	-1319.	1316.	DISTILLA	-3.	0	0.31	0.36	0.29
34 GTRA12 GT-85RE-12 POWR	0.	63.	133.	41.	48.	14.	394.	0.	527.	DISTILLA	527.	0	0.11	0.09	0.71
34 GTRA12 GT-85RE-12 HEAT	0.	588.	1235.	375.	442.	130.	0.	-1233.	1235.	DISTILLA	3.	0	0.32	0.36	0.30
35 GTRA16 GT-85RE-16 POWR	0.	65.	137.	45.	48.	14	389.	0.	526.	DISTILLA	526.	0	0.11	0.09	0.71
35 GTRA16 GT-85RE-16 HEAT	0.	545.	1151.	375.	402.	118.	0.	-1106.	1151.	DISTILLA	45.	0	0.32	0.35	0.33
36 GTR208 GT-60RE-08 POWR	0.	66.	149.	56.	48.	14.	375.	0.	525.	DISTILLA	525.	0	0.11	0.09	0.71
36 GTR208 GT-60RE-08 HEAT	0.	441.	999.	375.	320.	94.	0.	-850.	999.	DISTILLA	149.	0	0.31	0.32	0.38
37 GTR212 GT-60RE-12 POWR	0.	66.	145.	52.	48.	14.	380.	0.	525.	DISTILLA	525.	0	0.11	0.09	0.71
37 GTR212 GT-60RE-12 HEAT	0.	474.	1040.	375.	343.	101.	0.	-924.	1040.	DISTILLA	117.	0	0.31	0.33	0.36
38 GTR216 GT-60RE-16 POWR	0.	67.	142.	51.	48.	14.	382.	0.	523.	DISTILLA	523.	0	0.11	0.09	0.72
38 GTR216 GT-60RE-16 HEAT	0.	497.	1050.	375.	354.	104.	0.	-956.	1050.	DISTILLA	94.	0	0.32	0.34	0.36
39 GTRW08 GT-85RE-08 POWR	0.	52.	136.	33.	48.	14.	403.	0.	539.	DISTILLA	539.	10	0.09	0.09	0.70
39 GTRW08 GT-85RE-08 HEAT	0.	593.	1564.	375.	549.	161.	0.	-1566.	1564.	DISTILLA	-2.	0	0.27	0.35	0.24
40 GTRW12 GT-85RE-12 POWR	0.	57.	131.	33.	48.	14.	402.	0.	533.	DISTILLA	533.	10	0.10	0.09	0.70
40 GTRW12 GT-85RE-12 HEAT	0.	645.	1484.	375.	540.	158.	0.	-1538.	1484.	DISTILLA	-55.	0	0.30	0.36	0.25

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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INDUSTRY 29111 MW 14.00 PROCESS MILLIONS BTU/HR 375.0 PROCESS TEMP(F) 470. PRODUCT SMALL-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.127

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	59.	134.	37.	48.	14.	398.	0.	532	DISTILLA	532.	10	0.10	0.09	0.71
41 GTRW16 GT-85RE-16 HEAT	0.	598.	1360.	375.	485.	142.	0.	-1368.	1360	DISTILLA	-8.	0	0.31	0.36	0.28
42 GTR308 GT-60RE-08 POWR	0.	47.	154.	44.	48.	14.	389.	0.	544	DISTILLA	544.	10	0.08	0.09	0.69
42 GTR308 GT-60RE-08 HEAT	0.	400.	1316.	375.	408.	120.	0.	-1125.	1316	DISTILLA	190.	0	0.23	0.31	0.29
43 GTR312 GT-60RE-12 POWR	0.	62.	140.	44.	48.	14.	389.	0.	529	DISTILLA	529.	10	0.10	0.09	0.71
43 GTR312 GT-60RE-12 HEAT	0.	522.	1180.	375.	404.	118.	0.	-1112.	1180	DISTILLA	68.	0	0.31	0.34	0.32
44 GTR316 GT-60RE-16 POWR	0.	62.	141.	45.	48.	14.	388.	0.	529	DISTILLA	529.	10	0.10	0.09	0.71
44 GTR316 GT-60RE-16 HEAT	0.	511.	1169.	375.	396.	116.	0.	-1089	1169	DISTILLA	80.	0	0.30	0.34	0.32
45 FCPADS FUEL-CL-PH POWR	0.	49.	126.	21.	48.	14.	416.	0.	542	DISTILLA	542.	0	0.08	0.09	0.69
45 FCPADS FUEL-CL-PH HEAT	0.	855.	2206.	375.	838.	246.	0.	-2470.	2206	DISTILLA	-264.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	65.	116.	27.	48.	14.	409.	0.	525	DISTILLA	525.	0	0.11	0.09	0.71
46 FCMCDS FUEL-CL-MO HEAT	0.	904.	1609.	375.	663.	194.	0.	-1923.	1609	DISTILLA	-313.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29112 MW 52.00 PROCESS MILLIONS BTU/HR 1333.0 PROCESS TEMP(F) 470. PRODUCT MEDIUM-REFIN HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.133

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	1568.	554.	1568.	COAL-FGD	2123.	0	0.	0.08	0.63
1 STM141 STM-TURB-1 POWR	0.	346.	1559.	1148.	177.	52.	218.	0.	1777.	RESIDUAL	1777.	0	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	401.	1811.	1333.	206.	60.	0.	-89.	1811.	RESIDUAL	1721.	0	0.18	0.11	0.74
1 STM141 STM-TURB-1 POWR	0.	346.	1559.	1148.	177.	52.	218.	0.	1777.	COAL-FGD	1777.	0	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	401.	1811.	1333.	206.	60.	0.	-89.	1811.	COAL-FGD	1721.	0	0.18	0.11	0.74
1 STM141 STM-TURB-1 POWR	0.	346.	1559.	1148.	177.	52.	218.	0.	1777.	COAL-AFB	1777.	0	0.16	0.10	0.75
1 STM141 STM-TURB-1 HEAT	0.	401.	1811.	1333.	206.	60.	0.	-89	1811.	COAL-AFB	1721.	0	0.18	0.11	0.74
2 STM088 STM-TURB-8 POWR	0.	-141.	2264.	1747.	177.	52.	-487.	0.	2264.	RESIDUAL	2264.	0	-0.07	0.08	0.59
2 STM088 STM-TURB-8 HEAT	0.	264.	1728.	1333.	135.	40.	0.	131.	1728.	RESIDUAL	1859.	0	0.12	0.07	0.72
2 STM088 STM-TURB-8 POWR	0.	-141.	2264.	1747.	177.	52.	-487.	0.	2264.	COAL-FGD	2264.	0	-0.07	0.08	0.59
2 STM088 STM-TURB-8 HEAT	0.	264.	1728.	1333.	135.	40.	0.	131.	1728.	COAL-FGD	1859.	0	0.12	0.07	0.72
2 STM088 STM-TURB-8 POWR	0.	-141.	2264.	1747.	177.	52.	-487.	0.	2264.	COAL-AFB	2264.	0	-0.07	0.08	0.59
2 STM088 STM-TURB-8 HEAT	0.	264.	1728.	1333.	135.	40.	0.	131.	1728.	COAL-AFB	1859.	0	0.12	0.07	0.72
3 PFBSTM PFB-STMTB- POWR	0.	335.	965.	634.	177.	52.	822.	0.	1788.	COAL-PFB	1788.	0	0.16	0.10	0.75
3 PFBSTM PFB-STMTB- HEAT	0.	704.	2030.	1333.	373.	109.	0.	-611.	2030.	COAL-PFB	1418.	0	0.26	0.18	0.66
4 TISTMT TI-STMTB-1 POWR	0.	339.	757.	461.	177.	52.	1026.	0.	1783.	RESIDUAL	1783.	0	0.16	0.10	0.75
4 TISTMT TI-STMTB-1 HEAT	0.	982.	2190.	1333.	513.	150.	0.	-1049.	2190.	RESIDUAL	1141.	0	0.31	0.23	0.61
4 TISTMT TI-STMTB-1 POWR	0.	339.	757.	461.	177.	52.	1026.	0.	1783.	COAL	1783.	0	0.16	0.10	0.75
4 TISTMT TI-STMTB-1 HEAT	0.	982.	2190.	1333.	513.	150.	0.	-1049.	2190.	COAL	1141.	0	0.31	0.23	0.61
5 TIHRSG THERMIONIC POWR	0.	193.	1261.	764.	177.	52.	669.	0.	1930.	RESIDUAL	1930.	0	0.09	0.09	0.69
5 TIHRSG THERMIONIC HEAT	0.	336.	2200.	1333.	309.	91.	0.	-413.	2200.	RESIDUAL	1787.	0	0.13	0.14	0.61
5 TIHRSG THERMIONIC POWR	0.	193.	1261.	764.	177.	52.	669.	0.	1930.	COAL	1930.	0	0.09	0.09	0.69
5 TIHRSG THERMIONIC HEAT	0.	336.	2200.	1333.	309.	91.	0.	-413.	2200.	COAL	1787.	0	0.13	0.14	0.61
6 STIRL STIRLING-1 POWR	0.	233.	790.	398.	177.	52.	1100.	0.	1890.	DISTILLA	1890.	0	0.11	0.09	0.71
6 STIRL STIRLING-1 HEAT	0.	780.	2644.	1333.	594.	174.	0.	-1302.	2644.	DISTILLA	1343.	0	0.23	0.22	0.50

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

ISSE PED ADV DESIGN ENGR REPORT 5.1

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INDUSTRY 29112 MW 52.00 PROCESS MILLIONS BTU/HR 1333.0 PROCESS TEMP(F) 470. PRODUCT MEDIUM-REFIN HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.133

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	233.	790.	398.	177.	52.	1100.	0.	1890.	RESIDUAL	1890.	0	0.11	0.09	0.71
6 STIRL STIRLING-1 HEAT	0.	780.	2644.	1333.	594.	174.	0.	-1302.	2644.	RESIDUAL	1343.	0	0.23	0.22	0.50
6 STIRL STIRLING-1 POWR	0.	233.	790.	398.	17[illegible].	52.	1100.	0.	1890.	COAL	1890.	0	0.11	0.09	0.71
6 STIRL STIRLING-1 HEAT	0.	780.	2644.	1333.	594.	174.	0.	-1302.	2644.	COAL	1343.	0	0.23	0.22	0.50
7 HEGT85 HELIUM-GT- POWR	0.	-36.	553.	-32.	177.	52.	1606.	0.	2159.	COAL-AFB	2159.	1	-0.02	0.08	0.62
7 HEGT85 HELIUM-GT- HEAT-22797.		1497.	-22797.	1333.	-7318.	-2145.	0.	23422.	-22797	COAL-AFB	626.	11	*****	*****	2.13
8 HEGT60 HELIUM-GT- POWR	0.	10.	685.	120.	177.	52.	1427.	0.	2112.	COAL-AFB	2112.	0	0.00	0.08	0.63
8 HEGT60 HELIUM-GT- HEAT	0	115.	7623.	1333.	1974.	579.	0.	-5615.	7623.	COAL-AFB	2008.	0	0.01	0.26	0.17
9 HEGT00 HELIUM-GT- POWR	0.	100.	1008.	470.	177.	52.	1015.	0.	2023.	COAL-AFB	2023.	0	0.05	0.09	0.66
9 HEGT00 HELIUM-GT- HEAT	0.	283.	2857.	1333.	503.	147.	0.	-1017.	2857.	COAL-AFB	1840.	0	0.09	0.18	0.47
10 FCMCCL FUEL-CL-MO POWR	0.	294.	584.	275.	177.	52.	1245.	0.	1829.	COAL	1829.	10	0.14	0.10	0.73
10 FCMCCL FUEL-CL-MO HEAT	0.	1427.	2832.	1333.	861.	252.	0.	-2136.	2832.	COAL	696.	0	0.34	0.30	0.47
11 FCSTC[illegible] FUEL-CL-ST POWR	0.	305.	483.	199.	177.	52.	1334.	0.	1817.	COAL	1817.	10	0.14	0.10	0.73
11 FCSTCL FUEL-CL-ST HEAT	0.	2048.	3238.	1333.	1189.	349.	0.	-3162.	3238.	COAL	75.	0	[illegible]	0.37	0.41
12 IGGTST INT-GAS-GT POWR	0.	237.	662.	293.	177.	52.	1224.	0.	1886.	COAL	1886.	10	0.11	0.09	0.71
12 IGGTST INT-GAS-GT HEAT	0.	1078.	3015.	1333.	808.	237.	0.	-1970.	3015.	COAL	1045.	0	0.26	0.27	0.44
13 GTSOAR GT-HRSG-10 POWR	0.	223.	612.	238.	177.	52.	1288.	0.	1900.	RESIDUAL	1900.	0	0.11	0.09	0.70
13 GTSOAR GT-HRSG-10 HEAT	0.	1247.	3422.	1333.	992.	291.	0.	-2547.	3422.	RESIDUAL	875.	0	0.27	0.29	0.39
14 GTAC08 GT-HRSG-08 POWR	0.	296.	657.	339.	177.	52.	1169.	0.	1827.	RESIDUAL	1827.	0	0.14	0.10	0.73
14 GTAC08 GT-HRSG-08 HEAT	0.	1165.	2584.	1333.	698.	204.	0.	-1626.	2584.	RESIDUAL	958.	0	0.31	0.27	0.52
15 GTAC12 GT-HRSG-12 POWR	0.	290.	582.	269.	177.	52.	1251.	0.	1833.	RESIDUAL	1833.	0	0.14	0.10	0.73
15 GTAC12 GT-HRSG-12 HEAT	0.	1433.	2879.	1333.	878.	257.	0.	-2189.	2879.	RESIDUAL	689.	0	0.33	0.31	0.46
16 GTAC16 GT-HRSG-16 POWR	0.	278.	549.	232.	177.	52.	1295.	0.	1845.	RESIDUAL	1845.	0	0.13	0.10	0.72
16 GTAC16 GT-HRSG-16 HEAT	0.	1598.	3158.	1333.	1020.	299.	0.	-2633.	3158.	RESIDUAL	525.	0	0.34	0.32	0.42
17 GTWC16 GT-HRSG-16 POWR	0.	260.	563.	228.	177.	52.	1300.	0.	1863.	RESIDUAL	1863.	0	0.12	0.10	0.72
17 GTWC16 GT-HRSG-16 HEAT	0.	1517.	3287.	1333.	1036.	304.	0.	-2682.	3287.	RESIDUAL	606.	0	0.32	0.32	0.41

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POWER TO HEAT RATIO 0.133

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0..

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	253.	486.	157.	177.	52.	1384.	0.	1870.	RESIDUAL	1870.	0	0.12	0.09	0.71
18 CC1626 GTST-16/26 HEAT	0.	2151.	4134.	1333.	1509.	442.	0.	-4163.	4134.	RESIDUAL	-29.	0	0.34	0.37	0.32
19 CC1622 GTST-16/22 POWR	0.	266.	494.	175.	177.	52.	1363.	0.	1857.	RESIDUAL	1857.	0	0.13	0.10	0.72
19 CC1622 GTST-16/22 HEAT	0.	2028.	3773.	1333.	1355.	397.	0.	-3679.	3773.	RESIDUAL	94.	0	0.35	0.36	0.35
20 CC1222 GTST-12/22 POWR	0.	268.	493.	176.	177.	52.	1361.	0.	1854.	RESIDUAL	1854.	0	0.13	0.10	0.72
20 CC1222 GTST-12/22 HEAT	0.	2034.	3738.	1333.	1345.	394.	0.	-3649.	3738.	RESIDUAL	89.	0	0.35	0.36	0.36
21 CC0822 GTST-08/22 POWR	0.	288.	530.	223.	177.	52.	1305.	0.	1835.	RESIDUAL	1835.	0	0.14	0.10	0.73
21 CC0822 GTST-08/22 HEAT	0.	1717.	3159.	1333.	1059.	310.	0.	-2754.	3159.	RESIDUAL	406.	0	0.35	0.34	0.42
22 STIG15 STIG-15-16 POWR	0.	96.	466.	6.	177.	52.	1561.	0.	2027.	RESIDUAL	2027.	1	0.05	0.09	0.66
22 STIG15 STIG-15-16 HEAT	0.	21115.	102538.	1333.	39067.	11450.	0.	*******	102538.	RESIDUAL	-18992.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	137.	494.	65.	177.	52.	1491.	0.	1985.	RESIDUAL	1985.	1	0.06	0.09	0.67
23 STIG10 STIG-10-16 HEAT	0.	2797.	10060.	1333.	3613.	1059.	0.	-10735.	10060.	RESIDUAL	-675.	1	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	156	529.	112.	177.	52.	1437.	0.	1966.	RESIDUAL	1966.	1	0.07	0.09	0.68
24 STIG1S STIG-1S-16 HEAT	0.	1869.	6324.	1333.	2120.	621.	0.	-6069.	6324.	RESIDUAL	254.	1	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	167.	478.	77.	177.	52.	1478.	0.	1956.	RESIDUAL	1956.	1	0.08	0.09	0.68
25 DEADV3 DIESEL-ADV HEAT	0.	2888.	8280.	1333.	3072.	900.	0.	-9045.	8280.	RESIDUAL	-765.	1	0.26	0.37	0.16
26 DEADV2 DIESEL-ADV POWR	0.	219.	478.	121.	177.	52.	1425.	0.	1904.	RESIDUAL	1904.	1	0.10	0.09	0.70
26 DEADV2 DIESEL-ADV HEAT	0.	2405.	5248.	1333.	1947.	571.	0.	-5530.	5248.	RESIDUAL	-282.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	296.	478.	187.	177.	52.	1348.	0.	1826.	RESIDUAL	1826.	1	0.14	0.10	0.73
27 DEADV1 DIESEL-ADV HEAT	0.	2112.	3409.	1333.	1265.	371.	0.	-3398.	3409.	RESIDUAL	11.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	245.	630.	271.	177.	52.	1249.	0.	1880.	RESIDUAL	1880.	0	0.11	0.09	0.71
28 DEHTPM ADV-DIESEL HEAT	0.	1195.	3100.	1333.	873.	256.	0.	-2173.	3100.	RESIDUAL	928.	0	0.28	0.28	0.43
29 DESOA3 DIESEL-SOA POWR	0.	136.	491.	62.	177.	52.	1495.	0.	1986.	DISTILLA	1986.	1	0.06	0.09	0.67
29 DESOA3 DIESEL-SOA HEAT	0.	2913.	10497.	1333.	3789.	1111.	0.	-11287.	10497.	DISTILLA	-790.	1	0.22	0.36	0.13
29 DESOA3 DIESEL-SOA POWR	0.	136.	491.	62.	177.	52.	1495.	0.	1986.	RESIDUAL	1986.	1	0.06	0.09	0.67
29 DESOA3 DIESEL-SOA HEAT	0.	2913.	10497.	1333.	3789.	1111.	0.	-11287.	10497.	RESIDUAL	-790.	1	0.22	0.36	0.13

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PFO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29112 MW 52.00 PROCESS MILLIONS BTU/HR 1333.0 PROCESS TEMP(F) 470. PRODUCT MEDIUM-REFIN HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.133

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	190.	491.	108.	177.	52.	1441.	0.	1933.	DISTILLA	1933.	1	0.09	0.09	0.69
30	DESOA2	DIESEL-SOA	HEAT	0.	2345.	6059.	1333.	2187.	641.	0.	-6281.	6059.	DISTILLA	-222.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	190.	491.	108.	177.	52.	1441.	0.	1933.	RESIDUAL	1933.	1	0.09	0.09	0.69
30	DESOA2	DIESEL-SOA	HEAT	0.	2345.	6059.	1333.	2187.	641.	0.	-6281.	6059.	RESIDUAL	-222.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	295.	491.	197.	177.	52.	1336.	0.	1828.	DISTILLA	1828.	1	0.14	0.10	0.73
31	DESOA1	DIESEL-SOA	HEAT	0.	1994.	3324.	1333.	1200.	352.	0.	-3196.	3324.	DISTILLA	129.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	295.	491.	197.	177.	52.	1336.	0.	1828.	RESIDUAL	1828.	1	0.14	0.10	0.73
31	DESOA1	DIESEL-SOA	HEAT	0.	1994.	3324.	1333.	1200.	352.	0.	-3196.	3324.	RESIDUAL	129.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	271.	608.	276.	177.	52.	1244.	0.	1851.	DISTILLA	1851.	0	0.13	0.10	0.72
32	GTSOAD	GT-HRSG-10	HEAT	0.	1311.	2937.	1333.	858.	251.	0.	-2126.	2937.	DISTILLA	811.	0	0.31	0.29	0.45
33	GTRA08	GT-85RE-08	POWR	0.	224.	497.	142.	177.	52.	1402.	0.	1899.	DISTILLA	1899.	0	0.11	0.09	0.70
33	GTRA08	GT-85RE-08	HEAT	0.	2109.	4677.	1333.	1670.	489.	0.	-4663.	4677.	DISTILLA	14.	0	0.31	0.36	0.29
34	GTRA12	GT-85RE-12	POWR	0.	236.	496.	150.	177.	52.	1391.	0.	1887.	DISTILLA	1887.	0	0.11	0.09	0.71
34	GTRA12	GT-85RE-12	HEAT	0.	2090.	4391.	1333.	1572.	461.	0.	-4358.	4391.	DISTILLA	33.	0	0.32	0.36	0.30
35	GTRA16	GT-85RE-16	POWR	0.	241.	508.	166.	177.	52.	1373.	0.	1882.	DISTILLA	1882.	0	0.11	0.09	0.71
35	GTRA16	GT-85RE-16	HEAT	0.	1939.	4091.	1333.	1428.	418.	0.	-3907.	4091.	DISTILLA	184.	0	0.32	0.35	0.33
36	GTR208	GT-60RE-08	POWR	0.	245.	554.	208.	177.	52.	1323.	0.	1878.	DISTILLA	1878.	0	0.12	0.09	0.71
36	GTR208	GT-60RE-08	HEAT	0.	1568.	3552.	1333.	1137.	333.	0.	-2938.	3552.	DISTILLA	554.	0	0.31	0.32	0.38
37	GTR212	GT-60RE-12	POWR	0.	245.	538.	194.	177.	52.	1340.	0.	1878.	DISTILLA	1878.	0	0.12	0.09	0.71
37	GTR212	GT-60RE-12	HEAT	0.	1684.	3698.	1333.	1220.	358.	0.	-3259.	3698.	DISTILLA	439.	0	0.31	0.33	0.36
38	GTR216	GT-60RE-16	POWR	0.	249.	526.	188.	177.	52.	1347.	0.	1873.	DISTILLA	1873.	0	0.12	0.09	0.71
38	GTR216	GT-60RE-16	HEAT	0.	1766.	3731.	1333.	1257.	369.	0.	-3375.	3731.	DISTILLA	356.	0	0.32	0.34	0.36
39	GTRW08	GT-85RE-08	POWR	0.	192.	505.	121.	177.	52.	1426.	0.	1931.	DISTILLA	1931.	0	0.09	0.09	0.69
39	GTRW08	GT-85RE-08	HEAT	0.	2107.	5559.	1333.	1951.	572.	0.	-5543.	5559.	DISTILLA	16.	0	0.27	0.35	0.24
40	GTRW12	GT-85RE-12	POWR	0.	212.	487.	123.	177.	52.	1423.	0.	1911.	DISTILLA	1911.	0	0.10	0.09	0.70
40	GTRW12	GT-85RE-12	HEAT	0.	2293.	5273.	1333.	1920.	563.	0.	-5444.	5273.	DISTILLA	-171.	0	0.30	0.36	0.25

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PED ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 20112 MW 52.00 PROCESS MILLIONS BTU/HR 1333.0 PROCESS TEMP(F) 470. PRODUCT MEDIUM-REFIN HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.133

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL [illegible] 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-65RE-16 POWR	0.	219.	497.	137.	177.	52.	1407.	0.	1904.	DISTILLA	1904.	0	0.10	0.09	0.70
41 GTRW16 GT-65RE-16 HEAT	0.	2127.	4833.	1333.	1725.	506.	0.	-4838.	4833.	DISTILLA	-4.	0	0.31	0.36	0.28
42 GTR308 GT-60RE-08 POWR	0.	174.	572.	163.	177.	52.	1376.	0.	1949.	DISTILLA	1949.	0	0.06	0.09	0.68
42 GTR308 GT-60RE-08 HEAT	0.	1422.	4676.	1333.	1450.	425.	0.	-3976.	4676.	DISTILLA	701.	0	0.23	0.31	0.29
43 GTR312 GT-60RE-12 POWR	0.	230.	519.	165.	177.	52.	1374.	0.	1893.	DISTILLA	1893.	0	0.11	0.09	0.70
43 GTR312 GT-60RE-12 HEAT	0.	1857.	4194.	1333.	1434.	420.	0.	-3928.	4194.	DISTILLA	266.	0	0.31	0.34	0.32
44 GTR316 GT-60RE-16 POWR	0.	229.	523.	168.	177.	52.	1371.	0.	1894.	DISTILLA	1894.	0	0.11	0.09	0.70
44 GTR316 GT-60RE-16 HEAT	0.	1815.	4157.	1333.	1409.	413.	0.	-3849.	4157.	DISTILLA	308.	0	0.30	0.34	0.32
45 FCPADS FUEL-CL-PH POWR	0.	181.	467.	79.	177.	52.	1475.	0.	1942.	DISTILLA	1942.	0	0.09	0.09	0.69
45 FCPADS FUEL-CL-PH HEAT	0.	3038.	7841.	1333.	2980.	873.	0.	-8757.	7841.	DISTILLA	-916.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	242.	431.	100.	177.	52.	1450.	0.	1881.	DISTILLA	1881.	0	0.11	0.09	0.71
46 FCMCDS FUEL-CL-MO HEAT	0.	3213.	5721.	1333.	2357.	691.	0.	-6811.	5721.	DISTILLA	-1090.	0	0.36	0.41	0.23

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29113 MW 126.00 PROCESS MILLIONS BTU/HR 3042.0 PROCESS TEMP(F) 470. PRODUCT LARGE-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.141

UTILITY FUEL COAL WASTE FUEL EQV BTU-10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCCN	N O C O G O N		0.	0.	0.	0.	0.	0.	3579.	1343.	[illegible]	COAL-FGD	4922.	0	0.	0.09	0.62
1	STM141	STM-TURB-1	POWR	0.	838.	3596.	2627.	430.	126.	489.	0	[illegible]	RESIDUAL	4085.	0	0.17	0.11	0.74
1	STM141	STM-TURB-1	HEAT	0.	970.	4165.	3042.	493.	146.	0.	-213.	[illegible]	RESIDUAL	3952.	0	0.19	0.12	0.73
1	STM141	STM-TURB-1	POWR	0.	838.	3596.	2627.	430.	126.	489.	0.	[illegible]	COAL-FGD	4085.	0	0.17	0.11	0.74
1	STM141	STM-TURB-1	HEAT	0.	970.	4165.	3042.	493.	146	0.	-213.	4165.	COAL-FGD	3952.	0	0.19	0.12	0.73
1	STM141	STM-TURB-1	POWR	0.	838.	3596.	2627.	430.	126.	489.	0.	4085.	COAL-AFB	4085.	0	0.17	0.11	0.74
1	STM141	STM-TURB-1	HEAT	0.	970.	4165.	3042.	493.	146.	0.	-213.	4165.	COAL-AFB	3952.	0	0.19	0.12	0.73
2	STM088	STM-TURB-8	POWR	0.	-177.	5100.	3905.	430.	126.	-1015.	0.	5100.	RESIDUAL	5100.	0	-0.04	0.08	0.60
2	STM088	STM-TURB-8	HEAT	0.	653.	3973.	3042.	335.	98.	0.	297.	3973.	RESIDUAL	4270.	0	0.13	0.08	0.71
2	STM088	STM-TURB-8	POWR	0.	-177.	5100.	3905.	430.	126.	-1015.	0.	5100.	COAL-FGD	5100.	0	-0.04	0.08	0.60
2	STM088	STM-TURB-8	HEAT	0.	653.	3973.	3042.	335.	98.	0.	297.	3973.	COAL-FGD	4270.	0	0.13	0.08	0.71
2	STM088	STM-TURB-8	POWR	0.	-177.	5100.	3905.	430.	126.	-1015.	0.	5100.	COAL-AFB	5100.	0	-0.04	0.08	0.60
2	STM088	STM-TURB-8	HEAT	0.	653.	3973.	3042.	335.	98.	0.	297.	3973.	COAL-AFB	4270.	0	0.13	0.08	0.71
3	PFBSTM	PFB-STMTB-	POWR	0.	814.	2277.	1485.	430.	126.	1832.	0.	4109.	COAL-PFB	4109.	0	0.17	0.10	0.74
3	PFBSTM	PFB-STMTB-	HEAT	0.	1667.	4665.	3042.	881.	258.	0.	-1409.	4665.	COAL-PFB	3255.	0	0.26	0.19	0.65
4	TISTMT	TI-STMTB-1	POWR	0.	823.	1798.	1086.	430.	126.	2302.	0.	4099.	RESIDUAL	4099.	0	0.17	0.10	0.74
4	TISTMT	TI-STMTB-1	HEAT	0.	2306.	5037.	3042.	1205.	353.	0.	-2421.	5037.	RESIDUAL	2617.	0	0.31	0.24	0.60
4	TISTMT	TI-STMTB-1	POWR	0.	823.	1798.	1086.	430.	126.	2302.	0.	4099.	COAL	4099.	0	0.17	0.10	0.74
4	TISTMT	TI-STMTB-1	HEAT	0.	2306.	5037.	3042.	1205.	353.	0.	-2421.	5037.	COAL	2617.	0	0.31	0.24	0.60
5	TIHRSG	THERMIONIC	POWR	0.	466.	3056.	1852.	430.	126.	1400.	0.	4456.	RESIDUAL	4456.	0	0.09	0.10	0.68
5	TIHRSG	THERMIONIC	HEAT	0.	766.	5020.	3042.	706.	207.	0.	-864.	5020.	RESIDUAL	4156.	0	0.13	0.14	0.61
5	TIHRSG	THERMIONIC	POWR	0.	466.	3056.	1852.	430.	126.	1400.	0.	4456.	COAL	4456.	0	0.09	0.10	0.68
5	TIHRSG	THERMIONIC	HEAT	0.	766.	5020.	3042.	706.	207.	0.	-864.	5020.	COAL	4156.	0	0.13	0.14	0.61
6	STIRL	STIRLING-1	POWR	0.	564.	1914.	965.	430.	126.	2444.	0.	4358.	DISTILLA	4358.	0	0.11	0.10	0.70
6	STIRL	STIRLING-1	HEAT	0.	1780.	6035.	3042.	1355.	397.	0.	-2892.	6035.	DISTILLA	3143.	0	0.23	0.22	0.50

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PED ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29113 MW 126.00 PROCESS MILLIONS BTU/HR 3042.0 PROCESS TEMP(F) 470. PRODUCT LARGE-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.141

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	564.	1914.	965.	430.	126.	2444.	0.	4358.	RESIDUAL	4358.	0	0.11	0.10	0.70
6 STIRL	STIRLING-1	HEAT	0.	1780.	6035.	3042.	1355.	397.	0.	-2892.	6035.	RESIDUAL	3143.	0	0.23	0.22	0.50
6 STIRL	STIRLING-1	POWR	0.	564.	1914.	965.	430.	126.	2444.	0.	4358.	COAL	4358.	0	0.11	0.10	0.70
6 STIRL	STIRLING-1	HEAT	0.	1780.	6035.	3042.	1355.	397.	0.	-2892.	6035.	COAL	3143.	0	0.23	0.22	0.50
7 HEGT85	HELIUM-GT-	POWR	0.	-88.	1339.	-78.	430.	126.	3671.	0.	5010.	COAL-AFB	5010.	1	-0.02	0.09	0.61
7 HEGT85	HELIUM-GT-	HEAT	-52024.	3416.	-52024.	3042.	-16700.	-4894.	0.	53530.	-52024.	COAL-AFB	1506.	11	-9.87	*****	2.02
8 HEGT60	HELIUM-GT-	POWR	0.	25.	1660.	290.	430.	126.	3237.	0.	4897.	COAL-AFB	4897.	0	0.01	0.09	0.62
8 HEGT60	HELIUM-GT-	HEAT	0.	263.	17396.	3042.	4506.	1321.	0.	-12737.	17396.	COAL-AFB	4660.	0	0.01	0.26	0.17
9 HEGT00	HELIUM-GT-	POWR	0.	242.	2443.	1140.	430.	126.	2238.	0.	4681.	COAL-AFB	4681.	0	0.05	0.09	0.65
9 HEGT00	HELIUM-GT-	HEAT	0.	645.	6520.	3042.	1148.	336.	0.	-2243.	6520.	COAL-AFB	4278.	0	0.09	0.18	0.47
10 FCMCCL	FUEL-CL-MO	POWR	0.	712.	1414.	666.	430.	126.	2796.	0.	4210.	COAL	4210.	0	0.14	0.10	0.72
10 FCMCCL	FUEL-CL-MO	HEAT	0.	3256.	6462.	3042.	1964.	576.	0.	-4796.	6462.	COAL	1667.	0	0.34	0.30	0.47
11 FCSTCL	FUEL-CL-ST	POWR	0.	741.	1160.	474.	430.	126.	3021.	0.	4181.	COAL	4181.	0	0.15	0.10	0.73
11 FCSTCL	FUEL-CL-ST	HEAT	0.	4754.	7445.	3042.	2759.	809.	0.	-7277.	7445.	COAL	168.	0	0.39	0.37	0.41
12 IGGTST	INT-GAS-GT	POWR	0.	577.	1584.	695.	430.	126.	2761.	0.	4346.	COAL	4346.	0	0.12	0.10	0.70
12 IGGTST	INT-GAS-GT	HEAT	0.	2525.	6936.	3042.	1882.	552.	0.	-4539.	6936.	COAL	2397.	0	0.27	0.27	0.44
13 GTSOAR	GT-HRSG-10	POWR	0.	540.	1482.	577.	430.	126.	2899.	0.	4382.	RESIDUAL	4382.	0	0.11	0.10	0.69
13 GTSOAR	GT-HRSG-10	HEAT	0.	2847.	7809.	3042.	2265.	664.	0.	-5734.	7809.	RESIDUAL	2076.	0	0.27	0.29	0.39
14 GTAC08	GT-HRSG-08	POWR	0.	718.	1592.	821.	430.	126.	2612.	0.	4205.	RESIDUAL	4205.	0	0.15	0.10	0.72
14 GTAC08	GT-HRSG-08	HEAT	0.	2658.	5896.	3042.	1592.	467.	0.	-3631.	5896.	RESIDUAL	2265.	0	0.31	0.27	0.52
15 GTAC12	GT-HRSG-12	POWR	0.	702.	1410.	653.	430.	126.	2811.	0.	4221.	RESIDUAL	4221.	0	0.14	0.10	0.72
15 GTAC12	GT-HRSG-12	HEAT	0.	3271.	6570.	3042.	2004.	587.	0.	-4918.	6570.	RESIDUAL	1651.	0	0.33	0.31	0.46
16 GTAC16	GT-HRSG-16	POWR	0.	673.	1331.	562.	430.	126.	2918.	0.	4249.	RESIDUAL	4249.	0	0.14	0.10	0.72
16 GTAC16	GT-HRSG-16	HEAT	0.	3646.	7207.	3042.	2328.	682.	0.	-5931.	7207.	RESIDUAL	1276.	0	0.34	0.32	0.42
17 GTWC16	GT-HRSG-16	POWR	0.	630.	1365.	553.	430.	126.	2928.	0.	4293.	RESIDUAL	4293.	0	0.13	0.10	0.71
17 GTWC16	GT-HRSG-16	HEAT	0.	3462.	7502.	3042.	2363.	693.	0.	-6042.	7502.	RESIDUAL	1461.	0	0.32	0.32	0.41

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29113 MW 126.00 PROCESS MILLIONS BTU/HR 3042.0 PROCESS TEMP(F) 470. PRODUCT LARGE-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.141

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	614.	1169.	374.	430.	126.	3139.	0.	4308.	RESIDUAL	4308.	0	0.12	0.10	0.71
18 CC1626 GTST-16/26 HEAT	0.	4995.	9508.	3042.	3496.	1025.	0.	-9581.	9508.	RESIDUAL	-73.	0	0.34	0.37	0.32
19 CC1622 GTST-16/22 POWR	0.	645.	1189.	417.	430.	126.	3089.	0.	4277.	RESIDUAL	4277.	0	0.13	0.10	0.71
19 CC1622 GTST-16/22 HEAT	0.	4710.	8677.	3042.	3139.	920.	0.	-8465.	8677.	RESIDUAL	212.	0	0.35	0.36	0.35
20 CC1222 GTST-12/22 POWR	0.	651.	1186.	419.	430.	126.	3085.	0.	4271.	RESIDUAL	4271.	0	0.13	0.10	0.71
20 CC1222 GTST-12/22 HEAT	0.	4724.	8599.	3042.	3118.	914.	0.	-8401.	8599.	RESIDUAL	198.	0	0.35	0.36	0.35
21 CC0822 GTST-08/22 POWR	0.	699.	1271.	532.	430.	126.	2953.	0.	4224.	RESIDUAL	4224.	0	0.14	0.10	0.72
21 CC0822 GTST-08/22 HEAT	0.	3996.	7267.	3042.	2459.	721.	0.	-6340.	7267.	RESIDUAL	926.	0	0.35	0.34	0.42
22 STIG15 STIG-15-16 POWR	0.	232.	1128.	15.	430.	126.	3562.	0.	4690.	RESIDUAL	4690.	1	0.05	0.09	0.65
22 STIG15 STIG-15-16 HEAT	0.	48165.	234000.	3042.	69154.	26130.	0.	*******	234000.	RESIDUAL	-43263.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	333.	1197.	159.	430.	126.	3392.	0.	4589.	RESIDUAL	4589.	1	0.07	0.09	0.66
23 STIG10 STIG-10-16 HEAT	0.	6384.	22958.	3042.	8244.	2416.	0.	-24420.	22958.	RESIDUAL	-1462.	1	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	379.	1283.	270.	430.	126.	3261.	0.	4543.	RESIDUAL	4543.	1	0.08	0.09	0.67
24 STIG1S STIG-1S-16 HEAT	0.	4264.	14431.	3042.	4837.	1418.	0.	-13773.	14431.	RESIDUAL	658.	1	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	404.	1159.	187.	430.	126.	3359.	0.	4518.	RESIDUAL	4518.	1	0.08	0.10	0.67
25 DEADV3 DIESEL-ADV HEAT	0.	6590.	18896.	3042.	7010.	2055.	0.	-20564.	18896.	RESIDUAL	-1668.	1	0.26	0.37	0.16
26 DEADV2 DIESEL-ADV POWR	0.	531.	1159.	294.	430.	126.	3233.	0.	4391.	RESIDUAL	4391.	1	0.11	0.10	0.69
26 DEADV2 DIESEL-ADV HEAT	0.	5488.	11976.	3042.	4443.	1302.	0.	-12542.	11976.	RESIDUAL	-565.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	718.	1159.	453.	430.	126.	3046.	0.	4205.	RESIDUAL	4205.	1	0.15	0.10	0.72
27 DEADV1 DIESEL-ADV HEAT	0.	4319.	7780.	3042.	2886.	846.	0.	-7677.	7780.	RESIDUAL	104.	1	0.33	0.37	0.39
28 DEHTP1 ADV-DIESEL POWR	0.	589.	1527.	657.	430.	126.	2806.	0.	4334.	RESIDUAL	4334.	0	0.12	0.10	0.70
28 DEHTP1 ADV-DIESEL HEAT	0.	2727.	7075.	3042.	1992.	584.	0.	-4880.	7075.	RESIDUAL	2195.	0	0.28	0.28	0.43
29 DESOA3 DIESEL-SOA POWR	0.	331.	1191.	151.	430.	126.	3401.	0.	4592.	DISTILLA	4592.	1	0.07	0.09	0.66
29 DESOA3 DIESEL-SOA HEAT	0.	6648.	23955.	3042.	8648.	2534.	0.	-25680.	23955.	DISTILLA	-1726.	1	0.22	0.36	0.13
29 DESOA3 DIESEL-SOA POWR	0.	331.	1191.	151.	430.	126.	3401.	0.	4592.	RESIDUAL	4592.	1	0.07	0.09	0.66
29 DESOA3 DIESEL-SOA HEAT	0.	6648.	23955.	3042.	8648.	2534.	0.	-25680.	23955.	RESIDUAL	-1726.	1	0.22	0.36	0.13

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29[illegible] MW 126.00 PROCESS MILLIONS BTU/HR 3042.0 PROCESS TEMP(F) 470. PRODUCT LARGE-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.141

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	461.	1191.	262.	430.	126.	3271.	0.	4461.	DISTILLA	4461.	1	0.09	0.10	0.68
30	DESOA2	DIESEL-SOA	HEAT	0.	5350.	13827.	3042.	4992.	1463.	0.	-14255.	13827.	DISTILLA	-428.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	461.	1191.	262.	430.	126.	3271.	0.	4461.	RESIDUAL	4461.	1	0.09	0.10	0.68
30	DESOA2	DIESEL-SOA	HEAT	0.	5350.	13827.	3042.	4992.	1463.	0.	-14255.	13827.	RESIDUAL	-428.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	714.	1191.	478.	430.	126.	3017.	0.	4208.	DISTILLA	4208.	1	0.15	0.10	0.72
31	DESOA1	DIESEL-SOA	HEAT	0.	4551.	7586.	3042.	2739.	803.	0.	-7215.	7586.	DISTILLA	372.	1	0.37	0.36	0.40
31	DESOA1	DIESEL-SOA	POWR	0.	714.	1191.	478.	430.	126.	3017.	0.	4208.	RESIDUAL	4208.	1	0.15	0.10	0.72
31	DESOA1	DIESEL-SOA	HEAT	0.	4551.	7586.	3042.	2739.	803.	0.	-7215.	7586.	RESIDUAL	372.	1	0.37	0.36	0.40
32	GTSOAD	GT-HRSG-10	POWR	0.	657.	1472.	669.	430.	126.	2793.	0.	4265.	DISTILLA	4265.	0	0.13	0.10	0.71
32	GTSOAD	GT-HRSG-10	HEAT	0.	2992.	6703.	3042.	1957.	574.	0.	-4773.	6703.	DISTILLA	1930.	0	0.31	0.29	0.45
33	GTRA08	GT-85RE-08	POWR	0.	543.	1204.	343.	430.	126.	3175.	0.	4379.	DISTILLA	4379.	0	0.11	0.10	0.69
33	GTRA08	GT-85RE-08	HEAT	0.	4813.	10673.	3042.	3810.	1117.	0.	-10564.	10673.	DISTILLA	109.	0	0.31	0.36	0.29
34	GTRA12	GT-85RE-12	POWR	0.	571.	1201.	365.	430.	126.	3150.	0.	4351.	DISTILLA	4351.	0	0.12	0.10	0.70
34	GTRA12	GT-85RE-12	HEAT	0.	4769.	10021.	3042.	3587.	1051.	0.	-9867.	10021.	DISTILLA	154.	0	0.32	0.36	0.30
35	GTRA16	GT-85RE-16	POWR	0.	584.	1232.	401.	430.	126.	3107.	0.	4338.	DISTILLA	4338.	0	0.12	0.10	0.70
35	GTRA16	GT-85RE-16	HEAT	0.	4425.	9335.	3042.	3258.	955.	0.	-8838.	9335.	DISTILLA	497.	0	0.32	0.35	0.33
36	GTR208	GT-60RE-08	POWR	0.	593.	1343	504.	430.	126.	2986.	0.	4329.	DISTILLA	4329.	0	0.12	0.10	0.70
36	GTR208	GT-60RE-08	HEAT	0.	3579.	8106.	3042.	2594.	760.	0.	-6763.	8106.	DISTILLA	1343.	0	0.31	0.32	0.38
37	GTR212	GT-60RE-12	POWR	0.	593.	1303.	470.	430.	126.	3026.	0.	4329.	DISTILLA	4329.	0	0.12	0.10	0.70
37	GTR212	GT-60RE-12	HEAT	0.	3843.	8440.	3042.	2785.	816.	0.	-7360.	8440.	DISTILLA	1080.	0	0.31	0.33	0.36
38	GTR216	GT-60RE-16	POWR	0.	604.	1276.	456.	430.	126.	3043.	0.	4318.	DISTILLA	4318.	0	0.12	0.10	0.70
38	GTR216	GT-60RE-16	HEAT	0.	4031.	8515.	3042.	2870.	841.	0.	-7624.	8515.	DISTILLA	891.	0	0.32	0.34	0.36
39	GTRW08	GT-85RE-08	POWR	0.	464.	1225.	294.	430.	126.	3233.	0.	4458.	DISTILLA	4458.	0	0.09	0.10	0.68
39	GTRW08	GT-85RE-08	HEAT	0.	4808.	12687.	3042.	4453.	1305.	0.	-12572.	12687.	DISTILLA	114.	0	0.27	0.35	0.24
40	GTRW12	GT-85RE-12	POWR	0.	514.	1181.	299.	430.	126.	3228.	0.	4409.	DISTILLA	4409.	0	0.10	0.10	0.69
40	GTRW12	GT-85RE-12	HEAT	0.	5234.	12034.	3042.	4381.	1284.	0.	-12346.	12034.	DISTILLA	-311.	0	0.30	0.36	0.25

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 29113 MW 126.00 PROCESS MILLIONS BTU/HR 3042.0 PROCESS TEMP(F) 470. PRODUCT LARGE-REFINE HOURS PER YEAR 8760.

POWER TO HEAT RATIO 0.141

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR.	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	530.	1204.	332.	430.	126.	3188.	0.	4392.	DISTILLA	4392.	0	0.11	0.10	0.69
41 GTRW16 GT 85RE-16 HEAT	0.	4854.	11030.	3042.	3938.	1154.	0.	-10962.	11030.	DISTILLA	68.	0	0.31	0.36	0.28
42 GTR308 GT-60RE-08 POWR	0.	422.	1387.	395.	430.	126.	3114.	0.	4501.	DISTILLA	4501.	0	0.09	0.10	0.68
42 GTR308 GT-60RE-08 HEAT	0.	3245.	10671.	3042.	3308.	970.	0.	-8994.	10671.	DISTILLA	1677.	0	0.23	0.31	0.29
43 GTR312 GT-60RE-12 POWR	0.	556.	1257.	400.	430.	126.	3109.	0.	4366.	DISTILLA	4366.	0	0.11	0.10	0.70
43 GTR312 GT-60RE-12 HEAT	0.	4237.	9571.	3042.	3273.	959.	0.	-8885.	9571.	DISTILLA	685.	0	0.31	0.34	0.32
44 GTR316 GT-60RE-16 POWR	0.	554.	1268.	407.	430.	126.	3100.	0.	4369.	DISTILLA	4369.	0	0.11	0.10	0.70
44 GTR316 GT-60RE-16 HEAT	0.	4142.	9486.	3042.	3216.	942.	0.	-8705.	9486.	DISTILLA	780.	0	0.30	0.34	0.32
45 FCPADS FUEL-CL-PH POWR	0.	438.	1131.	192.	430.	126.	3353.	0.	4484.	DISTILLA	4484.	0	0.09	0.10	0.68
45 FCPADS FUEL-CL-PH HEAT	0.	6934.	17894.	3042.	6800.	1993.	0.	-19906.	17894.	DISTILLA	-2012.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	586.	1043.	243.	430.	126.	3293.	0.	4336.	DISTILLA	4336.	0	0.12	0.10	0.70
46 FCMCDS FUEL-CL-MO HEAT	0.	7332.	13056.	3042.	5379.	1576.	0.	-15466.	13056.	DISTILLA	-2410.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32111 MW 5.50 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT FLAT-GLASS HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	0	0.	0.32	0.
1 STM141 STM-TURB-1 POWR	0.	3.	57.	30.	19.	6.	-35.	0.	57.	RESIDUAL	57.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	3.	57.	30.	19.	6.	-35.	0.	57.	COAL-FGD	57.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL-FGD	60.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	3.	57.	30.	19.	6.	-35.	0.	57.	COAL-AFB	57.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL-AFB	60.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-3.	63.	34.	19.	6.	-41.	0.	63.	RESIDUAL	63.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-3.	63.	34.	19.	6.	-41.	0.	63.	COAL-FGD	63.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL-FGD	60.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-3.	63.	34.	19.	6.	-41.	0.	63.	COAL-AFB	63.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL-AFB	60.	111	0.	0.	0.
3 PFBSTM PFB-STMTB- POWR	0.	10.	50.	24.	19.	6.	-28.	0.	50.	COAL-PFB	50.	11	0.17	0.38	0.
3 PFBSTM PFB-STMTB- HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL-PFB	60.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	14.	46.	20.	19.	6.	-23.	0.	46.	RESIDUAL	46.	11	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	14.	46.	20.	19.	6.	-23.	0.	46.	COAL	46.	11	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL	60.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-76.	136.	96.	19.	6.	-113.	0.	136.	RESIDUAL	136.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-76.	136.	96.	19.	6.	-113.	0.	136.	COAL	136.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL	60.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-2.	62.	26.	19.	6.	-30.	0.	62.	DISTILLA	62.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PFO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32111 MW 5.60 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT FLAT-GLASS HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	-2.	62.	26.	19.	6.	-30.	0.	62.	RESIDUAL	62.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-2.	62.	26.	19.	6.	-30.	0.	62.	COAL	62.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL	60.	111	0.	0.	0.
7	HEGT85	HELIUM-GT-	POWR	0.	0.	60.	27.	19.	6.	-31.	0.	60.	COAL-AFB	60.	11	0.00	0.32	0.
7	HEGT85	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL-AFB	60.	111	0.	0.	0.
8	HEGT60	HELIUM-GT-	POWR	0.	-14.	74.	32.	19.	6.	-37.	0.	74.	COAL-AFB	74.	11	-0.24	0.26	0.
8	HEGT60	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL-AFB	60.	111	0.	0.	0.
9	HEGT00	HELIUM-GT-	POWR	0.	-49.	109.	66.	19.	6.	-77.	0.	109.	COAL-AFB	109.	11	-0.82	0.18	0.
9	HEGT00	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL-AFB	60.	111	0.	0.	0.
10	FCMCCL	FUEL-CL-MO	POWR	0.	-3.	63.	30.	19.	6.	-35.	0.	63.	COAL	63.	11	-0.05	0.30	0.
10	FCMCCL	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL	60.	111	0.	0.	0.
11	FCSTCL	FUEL-CL-ST	POWR	0.	21.	39.	11.	19.	6.	-13.	0.	39.	COAL	39.	11	0.35	0.49	0.
11	FCSTCL	FUEL-CL-ST	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL	60.	111	0.	0.	0.
12	IGGTST	INT-GAS-GT	POWR	0.	12.	48.	15.	19.	6.	-17.	0.	48.	COAL	48.	11	0.20	0.40	0.
12	IGGTST	INT-GAS-GT	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	COAL	60.	111	0.	0.	0.
13	GTSOAR	GT-HRSG-10	POWR	0.	-6.	66.	33.	19.	6.	-38.	0.	66.	RESIDUAL	66.	11	-0.10	0.29	0.
13	GTSOAR	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	60	0.	RESIDUAL	60.	111	0.	0.	0.
14	GTAC08	GT-HRSG-08	POWR	0.	-11.	71.	34.	19.	6.	-40.	0.	71.	RESIDUAL	71.	11	-0.19	0.27	0.
14	GTAC08	GT-HRSG-08	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
15	GTAC12	GT-HRSG-12	POWR	0.	-3.	63.	32.	19.	6.	-38.	0.	63.	RESIDUAL	63.	11	-0.05	0.31	0.
15	GTAC12	GT-HRSG-12	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
16	GTAC16	GT-HRSG-16	POWR	0.	1.	59.	30.	19.	6.	-35.	0.	59.	RESIDUAL	59.	11	0.01	0.32	0.
16	GTAC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
17	GTWC16	GT-HRSG-16	POWR	0.	-1.	61.	24.	19.	6.	-28.	0.	61.	RESIDUAL	61.	11	-0.02	0.32	0.
17	GTWC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.

DATE 06/06/79 GENERAL ELECTRIC COMPANY

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32111 MW 5.60 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT FLAT-GLASS HOURS PER YEAR 7500.

POWER TO HEAT RATIO ******

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	18.	41.	9.	19.	6.	-11.	0.	41.	RESIDUAL	41.	11	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	18.	41.	10.	19.	6.	-12.	0.	41.	RESIDUAL	41.	11	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
20 CC1222 GTST-12/22 POWR	0.	19.	41.	10.	19.	6.	-12.	0.	41.	RESIDUAL	41.	11	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	18.	41.	12.	19.	6.	-14.	0.	41.	RESIDUAL	41.	11	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
22 STIG15 STIG-15-16 POWR	0.	10.	50.	1.	19.	6.	-1.	0.	50.	RESIDUAL	50.	11	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
23 STIG10 STIG-10-16 POWR	0.	7.	53.	7.	19.	6.	-8.	0.	53.	RESIDUAL	53.	11	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
24 STIG1S STIG-1S-16 POWR	0.	3.	57.	12.	19.	6.	-14.	0.	57.	RESIDUAL	57.	11	0.05	0.34	0.
24 STIG1S STIG-1S-16 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	8.	52.	19.	19.	6.	-22.	0.	52.	RESIDUAL	52.	1	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
26 DEADV2 DIESEL-ADV POWR	0.	8.	52.	13.	19.	6.	-15.	0.	52.	RESIDUAL	52.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
27 DEADV1 DIESEL-ADV POWR	0.	8.	52.	20.	19.	6.	-24.	0.	52.	RESIDUAL	52.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
28 DEHTPM ADV-DIESEL POWR	0.	12.	48.	24.	19.	6.	-29.	0.	48.	RESIDUAL	48.	1	0.20	0.40	0.
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	7.	53.	17.	19.	6.	-20.	0.	53.	DISTILLA	53.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	7.	53.	17.	19.	6.	-20.	0.	53.	RESIDUAL	53.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32111 MW 5.60 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT FLAT GLASS HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	7.	53.	12.	19.	6.	-14.	0.	53.	DISTILLA	53.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
30 DESOA2 DIESEL-SOA POWR	0.	7.	53.	12.	19.	6.	-14.	0.	53.	RESIDUAL	53.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	7.	53.	21.	19.	6.	-25.	0.	53.	DISTILLA	53.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	7.	53.	21.	19.	6.	-25.	0.	53.	RESIDUAL	53.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	RESIDUAL	60.	111	0.	0.	0
32 GTSOAD GT-HRSG-10 POWR	0.	-6.	65.	35.	19.	6.	-41.	0.	65.	DISTILLA	65.	11	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	[illegible]	0.	DISTILLA	60.	111	0.	0.	0.
33 GTRA08 GT-65RE-08 POWR	0.	6.	54.	22.	19.	6.	-25.	0.	54.	DISTILLA	54.	11	0.10	0.36	0.
33 GTRA08 GT-65RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
34 GTRA12 GT-65RE-12 POWR	0.	6.	53.	22.	19.	6.	-26.	0.	53.	DISTILLA	53.	11	0.11	0.36	0.
34 GTRA12 GT-65RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
35 GTRA16 GT-65RE-16 POWR	0.	5.	55.	23.	19.	6.	-27.	0	55.	DISTILLA	55.	11	0.08	0.35	0.
35 GTRA16 GT-65RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	60.	28.	19.	6.	-33.	0.	60.	DISTILLA	60.	11	0.	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
37 GTR212 GT-60RE-12 POWR	0.	2.	58.	26.	19.	6.	-30.	0.	58.	DISTILLA	58.	11	0.03	0.33	0.
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
38 GTR216 GT-60RE-16 POWR	0.	3.	57.	25.	19.	6.	-30.	0.	57.	DISTILLA	57.	11	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
39 GTRW08 GT-65RE-08 POWR	0.	5.	54.	18.	19.	6.	-21.	0.	54.	DISTILLA	54.	11	0.09	0.35	0.
39 GTRW08 GT-65RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
40 GTRW12 GT-65RE-12 POWR	0.	7.	52.	17.	19.	6.	-21.	0.	52.	DISTILLA	52.	11	0.12	0.36	0.
40 GTRW12 GT-65RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.

HONEYWELL PAGE PRINTING SYSTEM- P1185-02

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32111 MW 5.60 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT FLAT-GLASS HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	6.	54.	19.	19.	6.	-22.	0.	54.	DISTILLA	54.	11	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
42 GTR308 GT-60RE-08 POWR	0.	-2.	62.	28.	19.	6.	-33.	0.	62.	DISTILLA	62.	11	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	4.	56.	21.	19.	6.	-25.	0.	56.	DISTILLA	56.	11	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	3.	56.	22.	19.	6.	-25.	0.	56.	DISTILLA	56.	11	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	9.	50.	9.	19.	6.	-10.	0.	50.	DISTILLA	50.	1	0.16	0.38	0.
45 FCPADS F[illegible]-PH HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	13.	46.	11.	19.	6.	-13.	0.	46.	DISTILLA	46.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	60.	0.	DISTILLA	60.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32211 MW 5.10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT GLASS-CONTAI HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G E N		0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	0	0.	0.32	0.
1	STM141	STM-TURB-1	POWR	0.	2.	52.	27.	17.	5.	-32.	0	52.	RESIDUAL	52.	11	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	2.	52.	27.	17.	5.	-32.	0.	52.	COAL-FGD	52.	11	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL-FGD	54.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	2.	52.	27.	17.	5.	-32.	0.	52.	COAL-AFB	52.	11	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL-AFB	54.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-3.	57.	31.	17.	5.	-37.	0.	57.	RESIDUAL	57.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-3.	57.	31.	17.	5.	-37.	0.	57.	COAL-FGD	57.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL-FGD	54.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-3.	57.	31.	17.	5.	-37.	0.	57.	COAL-AFB	57.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL-AFB	54.	111	0	0.	0.
3	PFBSTM	PFB-STMTB-	POWR	0.	9.	45.	21.	17.	5.	-25.	0.	45.	COAL-PFB	45.	11	0.17	0.38	0.
3	PFBSTM	PFB-STMTB-	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL-PFB	54.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	12.	42.	18.	17.	5.	-21.	0.	42.	RESIDUAL	42.	11	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	12.	42.	18.	17.	5.	-21.	0.	42.	COAL	42.	11	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL	54.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-69.	124.	87.	17.	5.	-103.	0.	124.	RESIDUAL	124.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-69.	124.	87.	17.	5.	-103.	0.	124.	COAL	124.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL	54.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-2.	57.	24.	17.	5.	-28.	0.	57.	DISTILLA	57.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32211 MW 5 10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT GLASS-CONTAI HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-2.	57.	24.	17.	5.	-28.	0.	57.	RESIDUAL	57.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0	0.
6 STIRL STIRLING-1 POWR	0.	-2.	57.	24.	17.	5.	-28.	0.	57.	COAL	57.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL	54.	111	0.	0.	0.
7 HEGT85 HELIUM-GT- POWR	0.	0.	54.	24.	17.	5.	-28.	0.	54.	COAL-AFB	54.	11	0.00	0.32	0.
7 HEGT85 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL-AFB	54.	111	0.	0.	0.
8 HEGT60 HELIUM-GT- POWR	0.	-13.	67.	29.	17.	5.	-34.	0.	67.	COAL-AFB	67.	11	-0.24	0.26	0.
8 HEGT60 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL-AFB	54.	111	0.	0.	0.
9 HEGT00 HELIUM-GT- POWR	0.	-44.	99.	60.	17.	5.	-70.	0.	99.	COAL-AFB	99.	11	-0.82	0.18	0.
9 HEGT00 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL-AFB	54.	111	0.	0.	0.
10 FCMCCL FUEL-CL-MO POWR	0.	-3.	57.	27.	17.	5.	-32.	0.	57.	COAL	57.	11	-0.05	0.30	0.
10 FCMCCL FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL	54.	111	0.	0.	0.
11 FCSTCL FUEL-CL-ST POWR	0.	19.	35.	10.	17.	5.	-12.	0.	35.	COAL	35.	11	0.35	0.49	0.
11 FCSTCL FUEL-CL-ST HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL	54.	111	0.	0	0.
12 IGGTST INT-GAS-GT POWR	0.	11.	4[illegible]	13.	17.	5.	-16.	0.	44.	COAL	44.	11	0.20	.40	0.
12 IGGTST INT-GAS-GT HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	COAL	54.	111	0.		0.
13 GTSOAR GT-HRSG-10 POWR	0.	-6.	60.	30.	17.	5.	-35.	0.	60.	RESIDUAL	60.	11	-0.10	0.29	0.
13 GTSOAR GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
14 GTAC08 GT-HRSG-08 POWR	0.	-10.	64.	31.	17.	5.	-36.	0.	64.	RESIDUAL	64.	11	-0.19	0.27	0.
14 GTAC08 GT-HRSG-08 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
15 GTAC12 GT-HRSG-12 POWR	0.	-3.	57.	29.	17.	5.	-35.	0.	57.	RESIDUAL	57.	11	-0.05	0.31	0.
15 GTAC12 GT-HRSG-12 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
16 GTAC16 GT-HRSG-16 POWR	0.	1.	54.	27.	17.	5.	-32.	0.	54.	RESIDUAL	54.	11	0.01	0.32	0.
16 GTAC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
17 GTWC16 GT-HRSG-16 POWR	0.	-1.	55.	22.	17.	5.	-26.	0.	55.	RESIDUAL	55.	11	-0.02	0.32	0.
17 GTWC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32211 MW 5.10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT GLASS-CONTAI HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	17.	38.	9.	17.	5.	-10.	0.	38.	RESIDUAL	38.	11	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	17.	38.	9.	17.	5.	-11	0.	38.	RESIDUAL	38.	11	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
20 CC1222 GTST-12/22 POWR	0.	17.	37.	9.	17.	5.	-11.	0.	37.	RESIDUAL	37.	11	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	17.	38.	11.	17.	5.	-13.	0.	38.	RESIDUAL	38.	11	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
22 STIG15 STIG-15-16 POWR	0.	9.	46.	1.	17.	5.	-1.	0.	46.	RESIDUAL	46.	11	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
23 STIG10 STIG-10-16 POWR	0.	6.	48.	6.	17.	5.	-8.	0.	48.	RESIDUAL	48.	11	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
24 STIG15 STIG-15-16 POWR	0.	2.	52.	11.	17.	5.	-13.	0.	52.	RESIDUAL	52.	11	0.05	0.34	0.
24 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	7.	47.	17.	17.	5.	-20.	0.	47.	RESIDUAL	47.	1	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
26 DEADV2 DIESEL-ADV POWR	0.	7.	47.	12.	17.	5.	-14.	0.	47.	RESIDUAL	47.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
27 DEADV1 DIESEL-ADV POWR	0.	7.	47.	18.	17.	5.	-22.	0.	47.	RESIDUAL	47.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
28 DEHTPH ADV-DIESEL POWR	0.	11.	43.	22.	17.	5.	-26.	0.	43.	RESIDUAL	43.	1	0.20	0.40	0.
28 DEHTPH ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	6.	48.	16.	17.	5.	-18.	0.	48.	DISTILLA	48.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	6.	48.	16.	17.	5.	-18.	0.	48.	RESIDUAL	48.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32211 MW 5.10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT GLASS-CONTAI HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	6.	48.	11.	17.	5.	-12.	0.	48.	DISTILLA	48.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
30 DESOA2 DIESEL-SOA POWR	0.	6.	48.	11.	17.	5.	-12.	0.	48.	RESIDUAL	48.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	6.	48.	19.	17.	5.	-23.	0.	48.	DISTILLA	48.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	6.	48.	19.	17.	5.	-23.	0.	48.	RESIDUAL	48.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	RESIDUAL	54.	111	0.	0.	0.
32 GTSOAD GT-HRSG-10 POWR	0.	-5.	60.	32.	17.	5.	-38.	0.	60.	DISTILLA	60.	11	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
33 GTRA08 GT-85RE-08 POWR	0.	6.	49.	20.	17.	5.	-23.	0.	49.	DISTILLA	49.	11	0.10	0.36	0.
33 GTRA08 GT-85RE-08 HEAT	0.	0.	0.	0	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
34 GTRA12 GT-85RE-12 POWR	0.	6.	49.	20.	17.	5.	-23.	0.	49.	DISTILLA	49.	11	0.11	0.36	0.
34 GTRA12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
35 GTRA16 GT-85RE-16 POWR	0.	5.	50.	21.	17.	5.	-25.	0.	50.	DISTILLA	50.	11	0.08	0.35	0.
35 GTRA16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	54.	26.	17.	5.	-30.	0.	54.	DISTILLA	54.	11	0.	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
37 GTR212 GT-60RE-12 POWR	0.	2.	53.	24.	17.	5.	-28.	0.	53.	DISTILLA	53.	11	0.03	0.33	0.
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
38 GTR216 GT-60RE-16 POWR	0.	3.	52.	23.	17.	5.	-27.	0.	52.	DISTILLA	52.	11	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
39 GTRW08 GT-85RE-08 POWR	0.	5.	50.	16.	17.	5.	-19.	0	50.	DISTILLA	50.	11	0.09	0.35	0.
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
40 GTRW12 GT-85RE-12 POWR	0.	7.	48.	16.	17.	5.	-19.	0.	48.	DISTILLA	48.	11	0.12	0.36	0.
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32211 MW 5.10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT GLASS-CONTAI HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16	GT-85RE-16	POWR	0.	6.	49.	17.	17.	5.	-20.	0.	49.	DISTILLA	49.	11	0.10	0.36	0.
41 GTRW16	GT-85RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
42 GTR308	GT-60RE-08	POWR	0.	-2.	56.	25.	17.	5.	-30.	0.	56.	DISTILLA	56.	11	-0.03	0.31	0.
42 GTR308	GT-60RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
43 GTR312	GT-60RE-12	POWR	0	3.	51.	19.	17.	5.	-23.	0.	51	DISTILLA	51.	11	0.06	0.34	0.
43 GTR312	GT-60RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
44 GTR316	GT-60RE-16	POWR	0.	3.	51.	20.	17.	5.	-23.	0.	51.	DISTILLA	51.	11	0.06	0.34	0.
44 GTR316	GT-60RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
45 FCPADS	FUEL-CL-PH	POWR	0.	9.	46.	8.	17.	5.	-9.	0.	46.	DISTILLA	46.	1	0.16	0.38	0.
45 FCPADS	FUEL-CL-PH	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.
46 FCMCDS	FUEL-CL-MO	POWR	0.	12.	42.	10.	17.	5.	-12.	0.	42.	DISTILLA	42.	1	0.22	0.41	0.
46 FCMCDS	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	54.	0.	DISTILLA	54.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32291 MW 1.10 PROCESS MILLIONS BTU/HR 0 PROCESS TEMP(F) 0. PRODUCT PRESS-BLOW-G HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	0	0.	0.32	0.
1 STM141 STM-TURB-1 POWR	0.	0.	11.	6.	4.	1	-7.	0.	11.	RESIDUAL	11.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0	RESIDUAL	12.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	0.	11.	6.	4	1.	-7.	0.	11.	COAL-FGD	11.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL-FGD	12.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	0.	11.	6.	4.	1.	-7.	0.	11.	COAL-AFB	11.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL-AFB	12.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-1.	12.	7.	4.	1.	-8.	0.	12.	RESIDUAL	12.	11	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-1.	12.	7.	4.	1.	-8.	0.	12.	COAL-FGD	12.	11	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL-FGD	12.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-1.	12.	7.	4.	1.	-8.	0.	12.	COAL-AFB	12.	11	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL-AFB	12.	111	0.	0.	0.
3 PFBSTM PFB-STMTB- POWR	0.	2.	10.	5	4.	1.	-5.	0.	10.	COAL-PFB	10.	11	0.17	0.38	0.
3 PFBSTM PFB-STMTB- HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL-PFB	12.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	3.	9.	4.	4.	1.	-5.	0.	9.	RESIDUAL	9.	11	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	3.	9.	4.	4.	1.	-5.	0.	9.	COAL	9.	11	0.23	0.41	0
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL	12.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-15.	27.	19.	4.	1.	-22.	0.	27.	RESIDUAL	27.	11	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-15.	27.	19.	4.	1.	-22.	0.	27.	COAL	27.	11	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL	12.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-0.	12.	5.	4.	1.	-6.	0.	12.	DISTILLA	12.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32291 MW 1.10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT PRESS-BLOW-G HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	-0.	12.	5.	4.	1.	-6.	0.	12.	RESIDUAL	12.	1	-0.04	0.31	0.
6 STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0	RESIDUAL	12.	111	0.	0.	0.
6 STIRL	STIRLING-1	POWR	0.	-0.	12.	5.	4.	1.	-6.	0.	12.	COAL	12.	1	-0.04	0.31	0.
6 STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL	12.	111	0.	0.	0.
7 HEGT85	HELIUM-GT-	POWR	0.	0.	12.	5.	4.	1.	-6.	0.	12.	COAL-AFB	12.	11	0.00	0.32	0.
7 HEGT85	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL-AFB	12.	111	0.	0.	0.
8 HEGT60	HELIUM-GT-	POWR	0.	-3.	14.	6.	4.	1.	-7.	0.	14.	COAL-AFB	14.	11	-0.24	0.26	0.
8 HEGT60	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL-AFB	12.	111	0.	0.	0.
9 HEGT00	HELIUM-GT-	POWR	0.	-10.	21.	13.	4.	1.	-15.	0.	21.	COAL-AFB	21.	11	-0.82	0.13	0.
9 HEGT00	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL-AFB	12.	111	0.	0.	0.
10 FCMCCL	FUEL-CL-MO	POWR	0.	-1.	12.	6.	4.	1.	-7.	0.	12.	COAL	12.	11	-0.05	0.30	0
10 FCMCCL	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL	12.	111	0.	0.	0.
11 FCSTCL	FUEL-CL-ST	POWR	0.	4.	8.	2.	4.	1.	-3.	0.	8.	COAL	8.	11	0.35	0.49	0.
11 FCSTCL	FUEL-CL-ST	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL	12.	111	0.	0.	0.
12 IGGTST	INT-GAS-GT	POWR	0.	2.	9.	3.	4.	1.	-3.	0.	9.	COAL	9.	11	0.20	0.40	0.
12 IGGTST	INT-GAS-GT	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	COAL	12.	111	0.	0.	0.
13 GTSOAR	GT-HRSG-10	POWR	0.	-1.	13.	6.	4.	1.	-8.	0.	13.	RESIDUAL	13.	11	-0.10	0.29	0.
13 GTSOAR	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
14 GTAC08	GT-HRSG-08	POWR	0.	-2.	14.	7.	4.	1.	-8.	0.	14.	RESIDUAL	14.	11	-0.19	0.27	0.
14 GTAC08	GT-HRSG-08	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
15 GTAC12	GT-HRSG-12	POWR	0.	-1.	12.	6.	4.	1.	-7.	0.	12.	RESIDUAL	12.	11	-0.05	0.31	0.
15 GTAC12	GT-HRSG-12	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
16 GTAC16	GT-HRSG-16	POWR	0.	0.	12.	6.	4.	1.	-7.	0.	12.	RESIDUAL	12.	11	0.01	0.32	0.
16 GTAC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
17 GTWC16	GT-HRSG-16	POWR	0.	-0.	12.	5.	4.	1.	-6.	0.	12.	RESIDUAL	12.	11	-0.02	0.32	0.
17 GTWC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32291 MW 1.10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT PRESS-BLOW-G HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	0.	4.	8.	2.	4.	1.	-2.	0.	8.	RESIDUAL	8.	11	0.31	0.46	0.
18	CC1626	GTST-16/26	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
19	CC1622	GTST-16/22	POWR	0.	4.	8.	2.	4.	1.	-2.	0.	8.	RESIDUAL	8.	11	0.31	0.46	0.
19	CC1622	GTST-16/22	HEAT	0.	0	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
20	CC1222	GTST-12/22	POWR	0.	4.	8.	2.	4.	1.	-2.	0.	8.	RESIDUAL	8.	11	0.31	0.47	0.
20	CC1222	GTST-12/22	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
21	CC0822	GTST-08/22	POWR	0.	4.	8.	2.	4.	1	-3.	0.	8.	RESIDUAL	8.	11	0.31	0.46	0.
21	CC0822	GTST-08/22	HEAT	0.	0.	0.	0.	0.	0	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
22	STIG15	STIG-15-16	POWR	0.	2.	10.	0.	4.	1.	-0.	0.	10.	RESIDUAL	10.	11	0.16	0.38	0.
22	STIG15	STIG-15-16	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
23	STIG10	STIG-10-16	POWR	0.	1.	10.	1.	4.	1.	-2.	0.	10.	RESIDUAL	10.	11	0.11	0.36	0.
23	STIG10	STIG-10-16	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
24	STIG1S	STIG-1S-16	POWR	0.	1.	11.	2.	4.	1.	-3.	0.	11.	RESIDUAL	11.	11	0.05	0.34	0.
24	STIG1S	STIG-1S-16	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
25	DEADV3	DIESEL-ADV	POWR	0.	2.	10.	4.	4.	1.	-4.	0.	10.	RESIDUAL	10.	11	0.14	0.37	0.
25	DEADV3	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
26	DEADV2	DIESEL-ADV	POWR	0.	2.	10.	3.	4.	1.	-3.	0.	10.	RESIDUAL	10.	11	0.14	0.37	0.
26	DEADV2	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
27	DEADV1	DIESEL-ADV	POWR	0.	2.	10.	4.	4.	1.	-5.	0.	10.	RESIDUAL	10.	11	0.14	0.37	0.
27	DEADV1	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
28	DEHTPM	ADV-DIESEL	POWR	0.	2.	9.	5.	4.	1.	-6.	0.	9.	RESIDUAL	9.	11	0.20	0.40	0.
28	DEHTPM	ADV-DIESEL	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
29	DESOA3	DIESEL-SOA	POWR	0.	1.	10.	3.	4.	1.	-4.	0.	10.	DISTILLA	10.	1	0.11	0.36	0.
29	DESOA3	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
29	DESOA3	DIESEL-SOA	POWR	0.	1.	10.	3.	4.	1.	-4.	0.	10.	RESIDUAL	10.	1	0.11	0.36	0.
29	DESOA3	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32291 NW 1.10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT PRESS-BLOW-G HOURS PER YEAR 7500.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**3= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	1.	10.	2.	4.	1.	-3.	0.	10.	DISTILLA	10.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0	DISTILLA	12.	111	0.	0.	0.
30 DESOA2 DIESEL-SOA POWR	0.	1.	10.	2.	4.	1.	-3.	0.	10.	RESIDUAL	10.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	1.	10.	4.	4.	1.	-5.	0.	10.	DISTILLA	10.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	1.	10.	4.	4.	1.	-5.	0.	10.	RESIDUAL	10.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	RESIDUAL	12.	111	0.	0.	0.
32 GTSOAD GT-HRSG-10 POWR	0.	-1.	13.	7.	4.	1.	-8.	0.	13.	DISTILLA	13.	11	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
33 GTRA08 GT-85RE-08 POWR	0.	1.	11.	4.	4.	1.	-5.	0.	11.	DISTILLA	11.	11	0.10	0.36	0.
33 GTRA08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
34 GTRA12 GT-85RE-12 POWR	0.	1.	10.	4.	4.	1.	-5.	0.	10.	DISTILLA	10.	11	0.11	0.36	0.
34 GTRA12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
35 GTRA16 GT-85RE-16 POWR	0.	1.	11.	5.	4.	1.	-5.	0.	11.	DISTILLA	11.	11	0.08	0.35	0.
35 GTRA16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	12.	6.	4.	1.	-7.	0.	12.	DISTILLA	12.	11	0.00	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
37 GTR212 GT-60RE-12 POWR	0.	0.	11.	5.	4.	1.	-6.	0.	11.	DISTILLA	11.	11	0.03	0.33	0.
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
38 GTR216 GT-60RE-16 POWR	0.	1.	11.	5.	4.	1.	-6.	0.	11.	DISTILLA	11.	11	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
39 GTRW08 GT-85RE-08 POWR	0.	1.	11.	4.	4.	1.	-4.	0.	11.	DISTILLA	11.	11	0.09	0.35	0.
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
40 GTRW12 GT-85RE-12 POWR	0.	1.	10.	3.	4.	1.	-4.	0.	10.	DISTILLA	10.	11	0.12	0.36	0.
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32?31 MW 1.10 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT PRESS-BLOW-G HOURS PER YEAR 7500

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	1.	11.	4.	4.	1.	-4.	0.	11.	DISTILLA	11.	11	0.10	0.38	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
42 GTR308 GT-60RE-08 POWR	0.	-0.	12.	5.	4.	1.	-6.	0.	12.	DISTILLA	12.	11	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	1.	11.	4.	4.	1.	-5.	0.	11.	DISTILLA	11.	11	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	1.	11.	4.	4.	1.	-5.	0.	11.	DISTILLA	11.	11	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	2.	10.	2.	4.	1.	-2.	0.	10.	DISTILLA	10.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	3.	9.	2.	4.	1.	-2.	0.	9.	DISTILLA	9.	11	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	12.	0.	DISTILLA	12.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32411 MW 20.32 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G G N	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	0	0.	0.32	0.
1 STM141 STM-TURB-1 POWR	0.	9.	208.	107.	69.	20.	-126.	0.	208.	RESIDUAL	208.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	9.	208.	107.	69.	20.	-126.	0.	208.	COAL-FGD	208.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL-FGD	217.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	9.	208.	107	69.	20.	-126.	0.	208	COAL-AFB	208.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0	0.	0.	0.	0.	217.	0.	COAL-AFB	217.	111	0.	0.	C.
2 STM088 STM-TURB-8 POWR	0.	-12.	229.	125.	69.	20.	-147.	0.	229.	RESIDUAL	229.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-12.	229.	125.	69.	20.	-147.	0.	229.	COAL-FGD	229.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL-FGD	217.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-12.	229.	125.	69.	20.	-147.	0	229.	COAL-AFB	229.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL-AFB	217.	111	0.	0.	0.
3 PFBSTM PFB-STMTB- POWR	0.	36.	181.	86.	69.	20.	-101.	0.	181.	COAL-PFB	181.	1	0.17	0.38	0.
3 PFBSTM PFB-STMTB- HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL-PFB	217.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	50.	167.	72.	69.	20.	-84.	0.	167.	RESIDUAL	167.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	50.	167.	72.	69.	20.	-84.	0.	167.	COAL	167.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL	217.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-276.	493.	348.	69.	20.	-410.	0.	493.	RESIDUAL	493.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	C.
5 TIHRSG THERMIONIC POWR	0.	-276.	493.	348.	69.	20.	-410.	0.	493.	COAL	493.	1	-1.27	0.14	0
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0	COAL	217.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-9.	225.	94.	59.	20.	-111.	0.	225.	DISTILLA	225.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32411 MW 20.32 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	-9.	225.	94.	69.	20.	-111.	0.	225.	RESIDUAL	225.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-9.	225.	94.	69.	20.	-111.	0.	225.	COAL	225.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL	217.	111	0.	0.	0.
7	HEGT85	HELIUM-GT-	POWR	0.	1.	216.	97.	69.	20.	-114.	0.	216.	COAL-AFB	216.	11	0.00	0.32	0.
7	HEGT85	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL-AFB	217.	111	0.	0.	0.
8	HEGT60	HELIUM-GT-	POWR	0.	-51.	268.	115.	69.	20.	-135.	0	268.	COAL-AFB	268.	11	-0.24	0.26	0.
8	HEGT60	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL-AFB	217.	111	0.	0.	0.
9	HEGT00	HELIUM-GT-	POWR	0.	-177.	394.	238.	69.	20.	-280.	0.	394.	COAL-AFB	394.	11	-0.82	0.18	0.
9	HEGT00	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL-AFB	217.	111	0.	0.	0.
10	FCMCCL	FUEL-CL-MO	POWR	0.	-11.	228.	109.	69.	20.	-128.	0.	228.	COAL	228.	11	-0.05	0.30	0.
10	FCMCCL	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL	217.	111	0.	0.	0.
11	FCSTCL	FUEL-CL-ST	POWR	0.	76.	141.	41.	69.	20.	-48.	0.	141.	COAL	141.	11	0.35	0.49	0.
11	FCSTCL	FUEL-CL-ST	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL	217.	111	0.	0.	0.
12	IGGTST	INT-GAS-GT	POWR	0.	43.	173.	54.	69.	20.	-63.	0.	173.	COAL	173.	11	0.20	0.40	0.
12	IGGTST	INT-GAS-GT	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	COAL	217.	111	0.	0.	0.
13	GTSOAR	GT-HRSG-10	POWR	0.	-22.	239.	118.	69.	20.	-139.	0.	239.	RESIDUAL	239.	1	-0.10	0.29	0.
13	GTSOAR	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
14	GTAC08	GT-HRSG-08	POWR	0.	-40.	257.	123.	69.	20.	-145.	0.	257.	RESIDUAL	257.	1	-0.19	0.27	0.
14	GTAC08	GT-HRSG-08	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
15	GTAC12	GT-HRSG-12	POWR	0.	-11.	227.	117.	69.	20.	-138.	0.	227.	RESIDUAL	227.	1	-0.05	0.31	0.
15	GTAC12	GT-HRSG-12	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
16	GTAC16	GT-HRSG-16	POWR	0.	2.	215.	108.	69.	20.	-127.	0.	215.	RESIDUAL	215.	1	0.01	0.32	0.
16	GTAC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
17	GTWC16	GT-HRSG-16	POWR	0.	-3.	220.	88.	69.	20.	-103.	0.	220.	RESIDUAL	220.	1	-0.02	0.32	0.
17	GTWC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32411 MW 20.32 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	66.	150.	34.	69.	20.	-40.	0.	150.	RESIDUAL	150.	1	0.31	0.46	0
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0
19 CC1622 GTST-16/22 POWR	0.	67.	150.	38.	69.	20.	-44.	0.	150.	RESIDUAL	150.	11	0.31	0.46	0
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0
20 CC1222 GTST-12/22 POWR	0.	68.	149.	37.	69.	20.	-44.	0.	149.	RESIDUAL	149.	1	0.31	0.47	0
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	66.	150.	44.	69.	20.	-52.	0.	150.	RESIDUAL	150.	1	0.31	0.46	0
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0
22 STIG15 STIG-15-16 POWR	0.	35.	182.	2.	69.	20.	-3.	0.	182.	RESIDUAL	182.	11	0.16	0.38	0
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0
23 STIG10 STIG-10-16 POWR	0.	24.	193.	26.	69.	20.	-30.	0.	193.	RESIDUAL	193.	1	0.11	0.36	0
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
24 STIGIS STIG-IS-16 POWR	0.	10.	207.	44.	69.	20.	-51.	0.	207.	RESIDUAL	207.	1	0.05	0.34	0
24 STIGIS STIG-IS-16 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	30.	187.	67.	69.	20.	-79.	0.	187.	RESIDUAL	187.	1	0.14	0.37	0
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0
26 DEADV2 DIESEL-ADV POWR	0.	30.	187.	47.	69.	20.	-56.	0.	187.	RESIDUAL	187.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0
27 DEADV1 DIESEL-ADV POWR	0.	30.	187.	73.	69.	20.	-86.	0.	187.	RESIDUAL	187.	1	0.14	0.37	0
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0
28 DEHTPM ADV-DIESEL POWR	0.	44.	173.	88.	69.	20.	-104.	0.	173.	RESIDUAL	173.	1	0.20	0.40	0
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	25.	192.	63.	69.	20.	-74.	0.	192.	DISTILLA	192.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	25.	192.	63.	69.	20.	-74.	0.	192.	RESIDUAL	192.	1	0.11	0.36	0
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0

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POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	25.	192.	42.	69.	20.	50.	0.	192.	DISTILLA	192.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
30 DESOA2 DIESEL-SOA POWR	0.	25.	192.	42.	69.	20.	-50.	0.	192.	RESIDUAL	192.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	25.	192.	77.	69.	20.	-91.	0.	192.	DISTILLA	192.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	25.	192.	77.	69.	20.	-91.	0.	192.	RESIDUAL	192.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	RESIDUAL	217.	111	0.	0.	0.
32 GTSOAD GT-HRSG-10 POWR	0.	-21.	237.	128.	69.	20.	-151.	0.	237.	DISTILLA	237.	1	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
33 GTRA08 GT-85RE-08 POWR	0.	22.	194.	78.	69.	20.	-92.	0.	194.	DISTILLA	194.	1	0.10	0.36	0.
33 GTRA08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
34 GTRA12 GT-85RE-12 POWR	0.	23.	194.	79.	69.	20.	-93.	0.	194.	DISTILLA	194.	1	0.11	0.36	0.
34 GTRA12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
35 GTRA16 GT-85RE-16 POWR	0.	18.	199.	84.	69.	20.	-99.	0.	199.	DISTILLA	199.	1	0.08	0.35	0.
35 GTRA16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	217.	102.	69.	20.	-120.	0.	217.	DISTILLA	217.	1	0.	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
37 GTR212 GT-60RE-12 POWR	0.	7.	210.	94.	69.	20.	-111.	0.	210.	DISTILLA	210.	1	0.03	0.33	0.
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
38 GTR216 GT-60RE-16 POWR	0.	11.	206.	92.	69.	20.	-108.	0.	206.	DISTILLA	206.	1	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
39 GTRW08 GT-85RE-08 POWR	0.	19.	198.	65.	69.	20.	-77.	0.	198.	DISTILLA	198.	1	0.09	0.35	0.
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
40 GTRW12 GT-85RE-12 POWR	0.	26.	190.	63.	69.	20.	-75.	0.	190.	DISTILLA	190.	1	0.12	0.36	0.
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

185E PED ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32411 MW 20.32 PROCESS MILLIONS BTU/HR 0 PROCESS TEMP(F) 0 PRODUCT CEMENT HOURS PER YEAR 7920

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	22.	194	68.	69.	20.	-80.	0.	194	DISTILLA	194.	1	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0	217.	0.	DISTILLA	217.	111	0	0.	0
42 GTR308 GT-60RE-08 POWR	0.	-7.	224.	100.	69.	20.	-118.	0.	224	DISTILLA	224.	1	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0
43 GTR312 GT-60RE-12 POWR	0.	14.	203.	77.	69.	20.	-91.	0.	203.	DISTILLA	203.	1	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	12.	205.	79.	69.	20.	-92.	0.	205.	DISTILLA	205.	1	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0
45 FCPADS FUEL-CL-PH POWR	0.	34.	182.	31.	69.	20.	-36.	0.	182.	DISTILLA	182.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	48.	168.	39.	69.	20.	-46.	0.	168.	DISTILLA	168.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0	0	0.	0.	0.	0.	217.	0.	DISTILLA	217.	111	0.	0.	0.

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32412 MW 27.09 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO- [illegible] 10** BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	0	0.	0.32	0.
1 STM141	STM-TURB-1	POWR	0.	12.	277.	143.	92.	27.	-168.	0.	277.	RESIDUAL	277.	1	0.04	0.33	0.
1 STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
1 STM141	STM-TURB-1	POWR	0.	12.	277.	143.	92.	27.	-168.	0.	277.	COAL-FGD	277.	1	0.04	0.33	0.
1 STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	COAL-FGD	289.	111	0.	0.	0.
1 STM141	STM-TURB-1	POWR	0.	12.	277.	143.	92.	27.	-168.	0.	277.	COAL-AFB	277.	1	0.04	0.33	0.
1 STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	COAL-AFB	289.	111	0.	0.	0.
2 STM088	STM-TURB-8	POWR	0.	-16.	305.	167.	92.	27.	-196.	0.	305.	RESIDUAL	305.	1	-0.06	0.30	0.
2 STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
2 STM088	STM-TURB-8	POWR	0.	-16.	305.	167.	92.	27.	-196.	0.	305.	COAL-FGD	305.	1	-0.06	0.30	0.
2 STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	COAL-FGD	289.	111	0.	0.	0.
2 STM088	STM-TURB-8	POWR	0.	-16.	305.	167.	92.	27.	-196.	0.	305.	COAL-AFB	305.	1	-0.06	0.30	0.
2 STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	COAL-AFB	289.	111	0.	0.	0.
3 PFBSTM	PFB-STMTB-	POWR	0.	48.	241.	114.	92.	27.	-134.	0.	241.	COAL-PFB	241.	1	0.17	0.38	0.
3 PFBSTM	PFB-STMTB-	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	COAL-PFB	289.	111	0.	0.	0.
4 TISTMT	TI-STMTB-1	POWR	0.	66.	223.	95.	92.	27.	-112.	0.	223.	RESIDUAL	223.	1	0.23	0.41	0.
4 TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
4 TISTMT	TI-STMTB-1	POWR	0.	66.	223.	95.	92.	27.	-112.	0.	223.	COAL	223.	1	0.23	0.41	0.
4 TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	COAL	289.	111	0.	0.	0.
5 TIHRSG	THERMIONIC	POWR	0.	-368.	657.	464.	92.	27.	-546.	0.	657.	RESIDUAL	657.	1	-1.27	0.14	0.
5 TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
5 TIHRSG	THERMIONIC	POWR	0.	-368.	657.	464.	92.	27.	-546.	0.	657.	COAL	657.	1	-1.27	0.14	0.
5 TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	COAL	289.	111	0.	0.	0.
6 STIRL	STIRLING-1	POWR	0.	-12.	300.	125.	92.	27.	-147.	0.	300.	DISTILLA	300.	1	-0.04	0.31	0.
6 STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

18SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32412 MW 27.09 PROCESS MILLIONS BTU/HR 0 PROCESS TEMP(F) 0 PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	-12.	300.	125.	92.	27.	-147.	0.	300	RESIDUAL	300.	1	-0 04	0.31	0
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	289	0	RESIDUAL	289.	111	0	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-12.	300.	125.	92.	27.	-147.	0.	300.	COAL	300.	1	-0 04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	289	0	COAL	289.	111	0.	0.	0
7	HEGT85	HELIUM-GT-	POWR	0.	1.	288.	129.	92.	27.	-151.	0	288	COAL-AFB	288.	11	0 00	0.32	0
7	HEGT85	HELIUM-GT-	HEAT	0.	0.	0	0.	0.	0.	0.	289	0	COAL-AFB	289.	111	0	0.	0.
8	HEGT60	HELIUM-GT-	POWR	0.	-68.	357	153	92.	27.	-180	0	357	COAL-AFB	357	11	-0 24	0.26	0.
8	HEGT60	HELIUM-GT-	HEAT	0.	0	0.	0	0.	0.	0.	289.	0	COAL-AFB	289.	111	0.	0.	0
9	HEGT00	HELIUM-GT-	POWR	0.	-236.	525	317.	92.	27.	-373	0	525.	COAL-AFB	525.	11	-0 82	0.18	0
9	HEGT00	HELIUM-GT-	HEAT	0.	0.	0.	0	0.	0.	0	289.	0.	COAL-AFB	289.	111	0	0	0
10	FCMCCL	FUEL-CL-MO	POWR	0.	-15.	304	145.	92.	27.	-171.	0	304	COAL	304.	11	-0 05	0.30	0
10	FCMCCL	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0	289.	0.	COAL	289.	111	0.	0.	0
11	FCSTCL	FUEL-CL-ST	POWR	0	101.	188.	54.	92.	27.	-64.	0	188	COAL	188.	11	0 35	0.49	0
11	FCSTCL	FUEL-CL-ST	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	COAL	289.	111	0	0.	0
12	IGGTST	INT-GAS-GT	POWR	0.	58.	231.	72.	92.	27.	-84	0.	231	COAL	231.	11	0 20	0.40	0.
12	IGGTST	INT-GAS-GT	HEAT	0.	0.	0.	0.	0.	0	0.	289.	0.	COAL	289.	111	0.	0	0.
13	GTSOAR	GT-HRSG-10	POWR	0.	-30.	319.	157.	92.	27.	-185.	0	319	RESIDUAL	319.	1	-0 10	0.29	0.
13	GTSOAR	GT-HRSG-10	HEAT	0.	0.	0.	0	0.	0.	0.	289	0	RESIDUAL	289.	111	0	0.	0.
14	GTAC08	GT-HRSG-08	POWR	0.	-53.	342.	164.	92.	27.	-193.	0.	342.	RESIDUAL	342.	1	-0 19	0.27	0
14	GTAC08	GT-HRSG-08	HEAT	0.	0.	0.	0.	0	0.	0.	289	0	RESIDUAL	289.	111	0	0.	0
15	GTAC12	GT-HRSG-12	POWR	0.	-14.	303.	156.	92.	27.	-184.	0	303	RESIDUAL	303.	1	-0 05	0.31	0.
15	GTAC12	GT-HRSG-12	HEAT	0.	0.	0	0.	0.	0.	0.	289.	0	RESIDUAL	289.	111	0	0.	0
16	GTAC16	GT-HRSG-16	POWR	0.	3.	286	144.	92.	27.	-169.	0.	286.	RESIDUAL	286.	1	0 01	0.32	0
16	GTAC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0
17	GTWC16	GT-HRSG-16	POWR	0.	-5.	293.	117.	92.	27.	-138.	0	293	RESIDUAL	293.	1	-0 02	0.32	0.
17	GTWC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0	0.	0.	289.	0	RESIDUAL	289.	111	0	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32412 MW 27.09 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	89.	200	45.	92.	27.	-53.	0.	200	RESIDUAL	200.	1	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	89.	200.	50.	92.	27.	-59.	0.	200.	RESIDUAL	200.	1	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
20 CC1222 GTST-12/22 POWR	0.	91.	198.	50.	92.	27.	-58.	0.	198.	RESIDUAL	198.	1	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	88.	200.	59.	92.	27.	-70.	0.	200.	RESIDUAL	200.	1	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
22 STIG15 STIG-15-16 POWR	0.	46.	243.	3.	92.	27.	-4.	0.	243.	RESIDUAL	243.	1	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
23 STIG10 STIG-10-16 POWR	0.	31.	257.	34.	92.	27.	-40.	0.	257.	RESIDUAL	257.	1	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
24 STIG1S STIG-1S-16 POWR	0.	13.	276.	58.	92.	27.	-68.	0.	276.	RESIDUAL	276.	1	0.05	0.34	0.
24 STIG1S STIG-1S-16 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	40.	249.	90.	92.	27.	-105.	0.	249.	RESIDUAL	249.	1	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
26 DEADV2 DIESEL-ADV POWR	0.	40.	249.	63.	92.	27.	-74.	0.	249.	RESIDUAL	249.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
27 DEADV1 DIESEL-ADV POWR	0.	40.	249.	97.	92.	27.	-115.	0.	249.	RESIDUAL	249.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
28 DEHTPM ADV-DIESEL POWR	0.	58.	230.	117.	92.	27.	-138.	0.	230.	RESIDUAL	230.	1	0.20	0.40	0.
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	33.	256.	83.	92.	27.	-98.	0.	256.	DISTILLA	256.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	33.	256.	83.	92.	27.	-98.	0.	256.	RESIDUAL	256.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32412 MW 27.09 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	33.	256.	56.	92.	27.	-66.	0.	256.	DISTILLA	256.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
30 DESOA2 DIESEL-SOA POWR	0.	33.	256.	56.	92.	27.	-66.	0.	256.	RESIDUAL	256.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	33.	256.	103.	92.	27.	-121.	0.	256.	DISTILLA	256.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	33.	256.	103.	92.	27.	-121.	0.	256.	RESIDUAL	256.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	RESIDUAL	289.	111	0.	0.	0.
32 GTSOAD GT-HRSG-10 POWR	0.	-28.	317.	171.	92.	27.	-201.	0.	317.	DISTILLA	317.	1	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
33 GTRA08 GT-85RE-08 POWR	0.	30.	259.	105.	92.	27.	-123.	0.	259.	DISTILLA	259.	1	0.10	0.36	0.
33 GTRA08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
34 GTRA12 GT-85RE-12 POWR	0.	31.	258.	106.	92.	27.	-124.	0.	258.	DISTILLA	258.	1	0.11	0.36	0.
34 GTRA12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0	0.
35 GTRA16 GT-85RE-16 POWR	0.	24.	265.	113.	92.	27.	-132.	0.	265.	DISTILLA	265.	1	0.08	0.35	0.
35 GTRA16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	289.	136.	92.	27.	-160.	0.	289.	DISTILLA	289.	1	0.	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
37 GTR212 GT-60RE-12 POWR	0.	9.	280.	125.	92.	27.	-147.	0.	280.	DISTILLA	280.	1	0.03	0.33	0.
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
38 GTR216 GT-60RE-16 POWR	0.	15.	274.	122.	92.	27.	-144.	0.	274.	DISTILLA	274.	1	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
39 GTRW08 GT-85RE-08 POWR	0.	26.	263.	87.	92.	27.	-102.	0.	263.	DISTILLA	263.	1	0.09	0.35	0.
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	269.	111	0.	0.	0.
40 GTRW12 GT-85RE-12 POWR	0.	35.	254.	85.	92.	27.	-99.	0.	254.	DISTILLA	254.	1	0.12	0.36	0.
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32412 MW 27.09 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	30.	259.	91.	92.	27.	-107.	0.	259.	DISTILLA	259.	1	0.10	0.36	0.
41 GTRW16 GT-35RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0
42 GTR308 GT-60RE-08 POWR	0.	-9.	298.	134.	92.	27.	-157.	0.	298.	DISTILLA	298.	1	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0
43 GTR312 GT-60RE-12 POWR	0.	19.	270.	103.	92.	27.	-121.	0.	270.	DISTILLA	270.	1	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	16.	273.	105.	92.	27.	-123.	0.	273.	DISTILLA	273.	1	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	46.	243.	41.	92.	27.	-49.	0.	243.	DISTILLA	243.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	64.	224.	52.	92.	27.	-61.	0.	224.	DISTILLA	224.	1	0.22	0.41	0
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	289.	0.	DISTILLA	289.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32113 HP 13.54 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	0	0.	0.32	0.
1	STM141	STM-TURB-1	POWR	0.	6.	138.	71.	46.	14.	-84.	0.	138.	RESIDUAL	138.	1	0.04	0.33	C.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0
1	STM141	STM-TURB-1	POWR	0.	6.	138.	71.	46.	14.	-84.	0.	138.	COAL-FGD	138.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL-FGD	144.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	6.	138.	71.	46.	14.	-84.	0.	138.	COAL-AFB	138.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL-AFB	144.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-8.	152.	83.	46.	14.	-98.	0.	152.	RESIDUAL	152.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-8.	152.	83.	46.	14.	-98.	0.	152.	COAL-FGD	152.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL-FGD	144.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-8.	152.	83.	46.	14.	-98.	0.	152.	COAL-AFB	152.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL-AFB	144.	111	0.	0.	0.
3	PFBSTM	PFB-STMTB-	POWR	0.	24.	121.	57.	46.	14.	-67.	0.	121.	COAL-PFB	121.	1	0.17	0.36	0.
3	PFBSTM	PFB-STMTB-	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL-PFB	144.	111	0.	0.	0
4	TISTMT	TI-STMTB-1	POWR	0.	33.	111.	48.	46.	14.	-56.	0.	111.	RESIDUAL	111.	1	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	33.	111.	48.	46.	14.	-56.	0.	111.	COAL	111.	1	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL	144.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-184.	328.	232.	46.	14.	-273.	0.	328.	RESIDUAL	328.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-184.	328.	232.	46.	14.	-273.	0.	328.	COAL	328.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL	144.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-6.	150.	63.	46.	14.	-74.	0.	150.	DISTILLA	150.	1	-0.04	0.31	0
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

** FUEL ENERGY SAVED BY PROCESS AND ECS**

INDUSTRY 32413 MW 13.54 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	-6.	150.	63.	46.	14.	-74.	0.	150.	RESIDUAL	150.	1	-0.04	0.31	0.
6 STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
6 STIRL	STIRLING-1	POWR	0.	-6.	150.	63.	46.	14.	-74.	0.	150.	COAL	150.	1	-0.04	0.31	0.
6 STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL	144.	111	0.	0.	0.
7 HEGT85	HELIUM-GT-	POWR	0.	0.	144.	64.	46.	14.	-76.	0.	144.	COAL-AFB	144.	11	0.00	0.32	0.
7 HEGT85	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL-AFB	144.	111	0.	0.	0.
8 HEGT60	HELIUM-GT-	POWR	0.	-34.	178.	77.	46.	14.	-90.	0.	178.	COAL-AFB	178.	11	-0.24	0.26	0.
8 HEGT60	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL-AFB	144	111	0.	0.	0.
9 HEGT00	HELIUM-GT-	POWR	0.	-118.	263.	159.	46.	14.	-187.	0.	263.	COAL-AFB	263.	11	-0.82	0.18	0.
9 HEGT00	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL-AFB	144.	111	0.	0.	0.
10 FCMCCL	FUEL-CL-MO	POWR	0.	-8.	152.	73.	46.	14.	-86.	0.	152.	COAL	152.	11	-0.05	0.30	0.
10 FCMCCL	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	144	0.	COAL	144.	111	0.	0.	0.
11 FCSTCL	FUEL-CL-ST	POWR	0.	50.	94.	27.	46.	14.	-32.	0.	94.	COAL	94.	11	0.35	0.49	0.
11 FCSTCL	FUEL-CL-ST	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL	144.	111	0.	0.	0.
12 IGGTST	INT-GAS-GT	POWR	0.	29.	116.	36.	46.	14.	-42	0.	116.	COAL	116.	11	0.20	0.40	0.
12 IGGTST	INT-GAS-GT	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	COAL	144.	111	0.	0.	0.
13 GTSOAR	GT-HRSG-10	POWR	0.	-15.	159.	79.	46.	14.	-93.	0.	159.	RESIDUAL	159.	1	-0.10	0.29	0.
13 GTSOAR	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
14 GTAC08	GT-HRSG-08	POWR	0.	-27.	171.	82.	46.	14.	-97.	0.	171.	RESIDUAL	171.	11	-0.19	0.27	0.
14 GTAC08	GT-HRSG-08	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
15 GTAC12	GT-HRSG-12	POWR	0.	-7.	152.	78.	46.	14.	-92.	0.	152.	RESIDUAL	152.	11	-0.05	0.31	0.
15 GTAC12	GT-HRSG-12	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
16 GTAC16	GT-HRSG-16	POWR	0.	1.	143.	72.	46.	14.	-85.	0.	143.	RESIDUAL	143.	11	0.01	0.32	0.
16 GTAC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
17 GTWC16	GT-HRSG-16	POWR	0.	-2.	147.	59.	46.	14.	-69.	0.	147.	RESIDUAL	147.	11	-0.02	0.32	0
17 GTWC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.

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* FUEL ENERGY SAVED BY PROCESS AND ECS **

INDUSTRY 3241 13 HW 13.54 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL — WASTE FUEL FOV BTU*10**6* 0. HOT WATER BTU*10**6* 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	0.	44.	100.	23.	46.	14.	-27.	0.	100.	RESIDUAL	100.	11	0.3[illegible]	0.46	0.
18	CC1626	GTST-16/26	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
19	CC1622	GTST-16/22	POWR	0.	44.	100.	25.	46.	14.	-29.	0.	100.	RESIDUAL	100.	11	0.31	0.46	0.
19	CC1622	GTST-16/22	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
20	CC1222	GTST-12/22	POWR	0.	45.	99.	25.	46.	14.	-29.	0.	99.	RESIDUAL	99.	11	0.31	0.47	0.
20	CC1222	GTST-12/22	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
21	CC0822	GTST-08/22	POWR	0.	44.	100.	30.	46.	14.	-35.	0.	100.	RESIDUAL	100.	11	0.31	0.46	0.
21	CC0822	GTST-08/22	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
22	STIG15	STIG-15-16	POWR	0.	23.	121.	2.	46.	14.	-2.	0.	121.	RESIDUAL	121.	11	0.16	0.[illegible]	0.
22	STIG15	STIG-15-16	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
23	STIG10	STIG-10-16	POWR	0.	16.	129.	17.	46.	14.	-20.	0.	129.	RESIDUAL	129.	11	0.11	0.36	0.
23	STIG10	STIG-10-16	HEAT	0.	0.	0.	0.	0.	0.	0	144.	0.	RESIDUAL	144.	111	0.	0.	0.
24	STIG1S	STIG-1S-16	POWR	0.	7.	138.	29.	46.	14.	-34.	0.	138.	RESIDUAL	138.	11	0.05	0.34	0.
24	STIG1S	STIG-1S-16	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
25	DEADV3	DIESEL-ADV	POWR	0.	20.	125.	45.	46.	14.	-53.	0.	125.	RESIDUAL	125.	1	0.14	0.37	0.
25	DEADV3	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
26	DEADV2	DIESEL-ADV	POWR	0.	20.	125.	32.	46.	14.	-37.	0.	125.	RESIDUAL	125.	1	0.14	0.37	0.
26	DEADV2	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
27	DEADV1	DIESEL-ADV	POWR	0.	20.	125.	49.	46.	14.	-57.	0.	125.	RESIDUAL	125.	1	0.14	0.37	0
27	DEADV1	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0	0.	0.
28	DEHTPH	ADV DIESEL	POWR	0.	29.	115.	59.	46.	14.	-69.	0.	115.	RESIDUAL	115.	1	0.20	0.40	0.
28	DEHTPH	ADV DIESEL	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
29	DESOA3	DIESEL-SOA	POWR	0.	16.	128.	42.	46.	14.	-49.	0.	128.	DISTILLA	128.	1	0.11	0.36	0
29	DESOA3	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
29	DESOA3	DIESEL-SOA	POWR	0.	16.	128.	42.	46.	14.	-49.	0.	128.	RESIDUAL	128.	1	0.11	0.36	0.
29	DESOA3	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32113 MW 13.54 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	16.	128.	28.	46.	14.	-33.	0.	128.	DISTILLA	128.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0
30 DESOA2 DIESEL-SOA POWR	0.	16.	128.	28.	46.	14.	-33.	0.	128.	RESIDUAL	128.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	16.	128.	51.	46.	14.	-60.	0.	128.	DISTILLA	128.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	16.	128.	51.	46.	14.	-60.	0.	128.	RESIDUAL	128.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	RESIDUAL	144.	111	0.	0.	0
32 GTSOAD GT-HRSG-10 POWR	0.	-14.	158.	85.	46.	14.	-100.	0.	158.	DISTILLA	158.	1	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
33 GTRA08 GT-85RE-08 POWR	0.	15.	129.	52.	46.	14.	-61.	0.	129.	DISTILLA	129.	1	0.10	0.36	0
33 GTRA08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
34 GTRA12 GT-85RE-12 POWR	0.	15.	129.	53.	46.	14.	-62.	0.	129.	DISTILLA	129.	11	0.11	0.36	0
34 GTRA12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0
35 GTRA16 GT-85RE-16 POWR	0.	12.	132.	56.	46.	14.	-66.	0.	132.	DISTILLA	132.	11	0.03	0.35	0.
35 GTRA16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	144.	68.	46.	14	-80.	0.	144.	DISTILLA	144.	1	0.	0.32	0
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0	0.	144.	0.	DISTILLA	144.	111	0.	0.	0
37 GTR212 GT-60RE-12 POWR	0.	4.	140.	63.	46.	14.	-74.	0.	140.	DISTILLA	140.	11	0.03	0.33	0
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0
38 GTR216 GT-60RE-16 POWR	0.	7.	137.	61.	46.	14.	-72.	0.	137.	DISTILLA	137.	11	0.05	0.34	0
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0
39 GTRW08 GT-85RE-08 POWR	0.	13.	132.	43.	46.	14.	-51.	0.	132.	DISTILLA	132.	11	0.09	0.35	0
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0	0
40 GTRW12 GT-85RE-12 POWR	0.	17.	127.	42.	46.	14.	-50.	0.	127.	DISTILLA	127.	11	0.12	0.36	0
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0	0.	0

** FUEL ENERGY SAVED BY PROCESS AND ECS**

INDUSTRY 32413 NW 13.54 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-SCRE-16 POWR	0.	15.	129.	45.	46.	14.	-53.	0.	129.	DISTILLA	129.	11	0.10	0.30	0.
41 GTRW16 GT-SCRE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
42 GTR308 GT-CORE-08 POWR	0.	-5.	149.	67.	46.	14	-79.	0.	149.	DISTILLA	149.	11	-0.03	0.31	0.
42 GTR308 GT-CORE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
43 GTR312 GT-CORE-12 POWR	0.	9.	135.	52.	46.	14.	-61.	0.	135.	DISTILLA	135.	11	0.06	0.34	0.
43 GTR312 GT-CORE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
44 GTR316 GT-CORE-16 POWR	0.	8.	136.	52.	46.	14.	-62.	0.	136.	DISTILLA	136.	11	0.06	0.34	0.
44 GTR316 GT-CORE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	23.	122.	21.	46.	14.	-24.	0.	122.	DISTILLA	122.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	32.	112.	26.	46.	14.	-31.	0.	112.	DISTILLA	112.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	144.	0.	DISTILLA	144.	111	0.	0.	0.

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32414 HW 6.77 PROCESS MILLION BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NU-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	0.	72.	0	DISTILLA	72.	0	0.	0.32	0.
1 STM141 STM-TURB-1 POWR	0.	3.	69.	36.	23.	7.	-42.	0.	69.	RESIDUAL	69.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	3.	69.	36.	23.	7.	-42.	0.	69.	COAL-FGD	69.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL-FGD	72.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	3.	69.	36.	23.	7.	-42.	0.	69.	COAL-AFB	69.	11	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL-AFB	72.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-4.	76.	42.	23.	7.	-49.	0.	76.	RESIDUAL	76.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-4.	76.	42.	23.	7.	-49.	0.	76	COAL-FGD	76.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL-FGD	72.	111	0.	0	0
2 STM088 STM-TURB-8 POWR	0.	-4.	76.	42.	23.	7.	-49.	0.	76.	COAL-AFB	76.	1	-0.06	0.30	0
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0	72.	0.	COAL-AFB	72.	111	0.	0.	0.
3 PFBSTM PFB-STMTB- POWR	0.	12.	60.	29.	23.	7.	-34.	0.	60.	COAL-PFB	60.	11	0.17	0.38	0.
3 PFBSTM PFB-STMTB- HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL-PFB	72.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	17.	56.	24.	23.	7.	-28.	0.	56.	RESIDUAL	56.	11	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	17.	56.	24.	23.	7.	-28.	0.	56.	COAL	56.	11	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL	72.	111	0.	0.	0
5 TIHRSG THERMIONIC POWR	0.	-92.	164.	116.	23.	7.	-137.	0.	164.	RESIDUAL	164.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-92.	164.	116.	23.	7.	-137.	0.	164.	COAL	164.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL	72.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-3.	75.	31.	2[illegible]	7.	-37.	0.	75.	DISTILLA	75.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	[illegible]	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32414 MW 6.77 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-3.	75.	31.	23.	7.	-37.	0.	75.	RESIDUAL	75.	1	-0.04	0.31	0
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-3.	75.	31.	23.	7.	-37.	0.	75.	COAL	75.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL	72.	111	0.	0.	0.
7 HEGT85 HELIUM-GT- POWR	0.	0.	72.	32.	23.	7.	-38.	0.	72.	COAL-AFB	72.	11	0.00	0.32	0.
7 HEGT85 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL-AFB	72.	111	0.	0.	0.
8 HEGT60 HELIUM-GT- POWR	0.	-17.	89.	38.	23.	7.	-45.	0.	89.	COAL-AFB	89.	11	-0.24	0.26	0.
8 HEGT60 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL-AFB	72.	111	0.	0.	0.
9 HEGT00 HELIUM-GT- POWR	0.	-59.	131.	79.	23.	7.	-93.	0.	131.	COAL-AFB	131.	1	-0.82	0.18	0.
9 HEGT00 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL-AFB	72.	111	0.	0	0.
10 FCMCCL FUEL-CL-MO POWR	0.	-4.	76.	36.	23.	7.	-43.	0.	76.	COAL	76.	11	-0.05	0.30	0.
10 FCMCCL FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL	72.	111	0.	0	0.
11 FCSTCL FUEL-CL-ST POWR	0.	25.	47.	14.	23.	7.	-16.	0.	47.	COAL	47.	11	0.35	0.49	0
11 FCSTCL FUEL-CL-ST HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL	72.	111	0.	0	0
12 IGGTST INT-GAS-GT POWR	0.	14.	58.	18.	23.	7.	-21.	0.	58.	COAL	58.	11	0.20	0.40	0.
12 IGGTST INT-GAS-GT HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	COAL	72.	111	0.	0.	0.
13 GTSOAR GT-HRSG-10 POWR	0.	-7.	80.	39.	23.	7.	-46.	0.	80.	RESIDUAL	80.	11	-0.10	0.29	0.
13 GTSOAR GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0	0.
14 GTAC08 GT-HRSG-08 POWR	0.	-13.	86.	41.	23.	7.	-48.	0.	86.	RESIDUAL	86.	11	-0.19	0.27	0.
14 GTAC08 GT-HRSG-08 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0.	0.
15 GTAC12 GT-HRSG-12 POWR	0.	-4.	76.	39.	23.	7.	-46.	0.	76.	RESIDUAL	76.	11	-0.05	0.31	0.
15 GTAC12 GT-HRSG-12 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0	0.
16 GTAC16 GT-HRSG-16 POWR	0.	1.	72.	36.	23.	7.	-42.	0.	72.	RESIDUAL	72.	11	0.01	0.32	0.
16 GTAC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0.	0.
17 GTWC16 GT-HRSG-16 POWR	0.	-1.	73.	29.	23.	7.	-34.	0.	73.	RESIDUAL	73.	11	-0.02	0.32	0.
17 GTWC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32414 MW 6.77 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0 PRODUCT CEMENT HOURS PER YEAR 7920

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	22	50.	11.	23.	7.	-13.	0.	50	RESIDUAL	50.	11	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	22.	50.	13.	23.	7.	-15.	0.	50	RESIDUAL	50.	11	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0	0.	0.	0.	0.	0	72.	0	RESIDUAL	72.	111	0	0.	0
20 CC1222 GTST-12/22 POWR	0.	23.	50.	12.	23.	7.	-15.	0.	50	RESIDUAL	50.	11	0.31	0.47	0
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	22	50.	15.	23.	7.	-17.	0.	50	RESIDUAL	50.	11	0.31	0.46	0
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0	0	0.
22 STIG15 STIG-15-16 POWR	0.	12.	61.	1.	23.	7.	-1.	0.	61	RESIDUAL	61.	11	0.16	0.38	0
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0	0.
23 STIG10 STIG-10-16 POWR	0.	8.	64.	9.	23.	7.	-10.	0.	64	RESIDUAL	64.	11	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0.	0
24 STIG1S STIG-1S-16 POWR	0.	3.	69.	15.	23.	7.	-17.	0.	69	RESIDUAL	69.	11	0.05	0.34	0
24 STIG1S STIG-1S-16 HEAT	0.	0	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0.	0
25 DEADV3 DIESEL-ADV POWR	0.	10.	62.	22.	23	7.	-26	0.	62	RESIDUAL	62.	1	0.14	0.37	0
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0	0	0
26 DEADV2 DIESEL-ADV POWR	0.	10.	62.	16.	23.	7.	-19.	0.	62	RESIDUAL	62.	1	0.14	0.37	0
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0	0.
27 DEADV1 DIESEL-ADV POWR	0.	10.	62.	24.	23.	7.	-29.	0.	62	RESIDUAL	62.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0	0.
28 DEHTPM ADV-DIESEL POWR	0.	15.	58.	29.	23.	7.	-35.	0.	58	PESIDUAL	58.	1	0.20	0.40	0
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	8.	64.	21.	23.	7.	-25.	0.	64	DISTILLA	64.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	DISTILLA	72.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	8.	64.	21.	23.	7.	-25.	0.	64	RESIDUAL	64.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0	0.	0

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32114 MW 6.77 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	8.	64.	14.	23.	7.	-17.	0.	64.	DISTILLA	64.	1	0.11	0.36	0.
30	DESOA2	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
30	DESOA2	DIESEL-SOA	POWR	0.	8.	64.	14.	23.	7.	-17.	0.	64.	RESIDUAL	64.	1	0.11	0.36	0
30	DESOA2	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0	RESIDUAL	72.	111	0.	0.	0.
31	DESOA1	DIESEL-SOA	POWR	0.	8.	64.	26.	23.	7.	-30.	0.	64.	DISTILLA	64.	1	0.11	0.36	0.
31	DESOA1	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
31	DESOA1	DIESEL-SOA	POWR	0.	8.	64.	26.	23.	7.	-30.	0.	64.	RESIDUAL	64.	1	0.11	0.36	0.
31	DESOA1	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	RESIDUAL	72.	111	0.	0.	0.
32	GTSOAD	GT-HRSG-10	POWR	0.	-7.	79.	43.	23.	7.	-50.	0.	79.	DISTILLA	79.	11	-0.10	0.29	0.
32	GTSOAD	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
33	GTRA08	GT-85RE-08	POWR	0.	7.	65.	26.	23.	7.	-31.	0.	65.	DISTILLA	65.	11	0.10	0.36	0.
33	GTRA08	GT-85RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
34	GTRA12	GT-85RE-12	POWR	0.	8.	65.	26.	23.	7.	-31.	0.	65.	DISTILLA	65.	11	0.11	0.36	0.
34	GTRA12	GT-85RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
35	GTRA16	GT-85RE-16	POWR	0.	6.	66.	28.	23.	7.	-33.	0.	66.	DISTILLA	66.	11	0.08	0.35	0.
35	GTRA16	GT-85RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
36	GTR208	GT-60RE-08	POWR	0.	0.	72.	34.	23.	7.	-40.	0.	72.	DISTILLA	72.	11	0.	0.32	0.
36	GTR208	GT-60RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
37	GTR212	GT-60RE-12	POWR	0.	2.	70.	31.	23.	7.	-37.	0.	70.	DISTILLA	70.	11	0.03	0.33	0.
37	GTR212	GT-60RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
38	GTR216	GT-60RE-16	POWR	0.	4.	69.	31.	23.	7.	-36.	0.	69.	DISTILLA	69.	11	0.05	0.34	0.
38	GTR216	GT-60RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
39	GTRW08	GT-85RE-08	POWR	0.	6.	66.	22.	23.	7.	-26.	0.	66.	DISTILLA	66.	11	0.09	0.35	0
39	GTRW08	GT-85RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
40	GTRW12	GT-85RE-12	POWR	0.	9.	64.	21.	23.	7.	-25.	0.	64	DISTILLA	64.	11	0.12	0.36	0.
40	GTRW12	GT-85RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 32414 MW 6.77 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT CEMENT HOURS PER YEAR 7920

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-6ŀFE-16 POWR	0.	7.	65.	23.	23.	7.	-27.	0.	65.	DISTILLA	65.	11	0.10	0.36	0
41 GTRW16 GT-60PE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0
42 GTR308 GT-60RE-08 POWR	0.	-2.	75.	33.	23.	7.	-39.	0.	75.	DISTILLA	75.	11	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0
43 GTR312 GT-60RE-12 POWR	0.	5.	68.	26.	23.	7.	-30.	0.	68.	DISTILLA	68.	11	0.06	0.34	0
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0
44 GTR316 GT-60RE-16 POWR	0.	4.	68.	26.	23.	7.	-31.	0.	68.	DISTILLA	68.	11	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	11.	61.	10.	23.	7.	-12.	0.	61.	DISTILLA	61.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	16.	56.	13.	23.	7.	-15.	0.	56.	DISTILLA	56.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	72.	0.	DISTILLA	72.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33121 MW 60.00 PROCESS MILLIONS BTU/HR 93.0 PROCESS TEMP(F) 448 PRODUCT SPECIAL-STEE HOURS PER YEAR 6700.

POWER TO HEAT RATIO 2.201

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	109.	640.	109.	COAL-AFB	749.	0	0.	0.27	0.12
1 STM141 STM-TURB-1 POWR	0.	-1682.	2431.	1862.	205.	60.	-2081.	0.	2431.	RESIDUAL	2431.	0	-2.25	0.08	0.04
1 STM141 STM-TURB-1 HEAT	0.	20.	121.	93.	10.	3.	0.	608.	121.	RESIDUAL	729.	10	0.03	0.01	0.13
1 STM141 STM-TURB-1 POWR	0.	-1682.	2431.	1862.	205.	60.	-2081.	0.	2431.	COAL-FGD	2431.	0	-2.25	0.08	0.04
1 STM141 STM-TURB-1 HEAT	0.	20.	121.	93.	10.	3.	0.	608.	121.	COAL-FGD	729.	10	0.03	0.01	0.13
1 STM141 STM-TURB-1 POWR	0.	-1682.	2431.	1862.	205.	60.	-2081.	0.	2431.	COAL-AFB	2431.	0	-2.25	0.08	0.04
1 STM141 STM-TURB-1 HEAT	0.	20.	121.	93.	10.	3.	0.	608.	121.	COAL-AFB	729.	10	0.03	0.01	0.13
2 STM088 STM-TURB-8 POWR	0.	-3515.	4264.	3420.	205.	60.	-3914.	0.	4264.	RESIDUAL	4264.	0	-4.69	0.05	0.02
2 STM088 STM-TURB-8 HEAT	0.	11.	116.	93.	6.	2.	0.	622.	116.	RESIDUAL	738.	10	0.01	0.01	0.13
2 STM088 STM-TURB-8 POWR	0.	-3515.	4264.	3420.	205.	60.	-3914.	0.	4264.	COAL-FGD	4264.	0	-4.69	0.05	0.02
2 STM088 STM-TURB-8 HEAT	0.	11.	116.	93.	6.	2.	0.	622.	116.	COAL-FGD	738.	10	0.01	0.01	0.13
2 STM088 STM-TURB-8 POWR	0.	-3515.	4264.	3420.	205.	60.	-3914.	0.	4264.	COAL-AFB	4264.	0	-4.69	0.05	0.02
2 STM088 STM-TURB-8 HEAT	0.	11.	116.	93.	6.	2.	0.	622.	116.	COAL-AFB	738.	10	0.01	0.01	0.13
3 PFBSTM PFB-STMTB- POWR	0.	-546.	1295.	882.	205.	60.	-928.	0.	1295.	COAL-PFB	1295.	0	-0.73	0.16	0.07
3 PFBSTM PFB-STMTB- HEAT	0.	40.	137.	93.	22.	6.	0.	572.	137.	COAL-PFB	709.	10	0.05	0.03	0.13
4 TISTMT TI-STMTB-1 POWR	0.	-228.	977.	619.	205.	60.	-619.	0.	977.	RESIDUAL	977.	0	-0.30	0.21	0.10
4 TISTMT TI-STMTB-1 HEAT	0.	59.	147.	93.	31.	9.	0.	544.	147.	RESIDUAL	690.	10	0.08	0.04	0.13
4 TISTMT TI-STMTB-1 POWR	0.	-228.	977.	619.	205.	60.	-619.	0.	977.	COAL	977.	0	-0.30	0.21	0.10
4 TISTMT TI-STMTB-1 HEAT	0.	59.	147.	93.	31.	9.	0.	544.	147.	COAL	690.	10	0.08	0.04	0.13
5 TIHRSG THERMIONIC POWR	0.	-706.	1455.	895.	205.	60.	-944.	0.	1455.	RESIDUAL	1455.	0	-0.94	0.14	0.06
5 TIHRSG THERMIONIC HEAT	0.	25.	151.	93.	21.	6.	0.	573.	151.	RESIDUAL	724.	0	0.03	0.03	0.13
5 TIHRSG THERMIONIC POWR	0.	-706.	1455.	895.	205.	60.	-944.	0.	1455.	COAL	1455.	0	-0.94	0.14	0.06
5 TIHRSG THERMIONIC HEAT	0.	25.	151.	93.	21.	6.	0.	573.	151.	COAL	724.	0	0.03	0.03	0.13
6 STIRL STIRLING-1 POWR	0.	-138.	887.	442.	205.	60.	-410.	0.	887.	DISTILLA	887.	0	-0.18	0.23	0.10
6 STIRL STIRLING-1 HEAT	0.	57.	187.	93.	43.	13.	0.	505.	187.	DISTILLA	692.	0	0.08	0.06	0.13

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33121 MW 60.00 PROCESS MILLIONS BTU/HR 93.0 PROCESS TEMP(F) 448. PRODUCT SPECIAL-STEE HOURS PER YEAR 6700.

POWER TO HEAT RATIO 2.201

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-136.	887.	442.	205.	60.	-410.	0.	887.	RESIDUAL	887.	0	-0.18	0.23	0.1C
6 STIRL STIRLING-1 HEAT	0.	57.	187.	93.	43.	13.	0.	505.	187.	RESIDUAL	692.	0	0.08	0.06	0.13
6 STIRL STIRLING-1 POWR	0.	-138.	887.	442.	205.	60.	-410.	0.	887.	COAL	887.	0	-0.18	0.23	0.10
6 STIRL STIRLING-1 HEAT	0.	57.	187.	93.	43.	13.	0.	505.	187.	COAL	692.	0	0.08	0.06	0.13
7 HEGT85 HELIUM-GT- POWR	0.	-12.	638.	-11.	205.	60.	123.	0.	761.	COAL-AFB	761.	1	-0.02	0.27	0.12
7 HEGT85 HELIUM-GT- HEAT	-5162.	93.	-5162.	93.	-1657.	-486.	0.	5817.	-5162	COAL-AFB	656.	11	-6.77	-2.53	0.14
8 HEGT60 HELIUM-GT- POWR	0.	-41.	790.	160.	205.	60.	-79.	0.	790.	COAL-AFB	790.	0	-0.06	0.26	0.12
8 HEGT60 HELIUM-GT- HEAT	0.	22.	460.	93.	119.	35.	0.	267.	460.	COAL-AFB	727.	10	0.03	0.16	0.13
9 HEGT00 HELIUM-GT- POWR	0.	-414.	1163.	548.	205.	60.	-535.	0.	1163.	COAL-AFB	1163.	0	-0.55	0.18	0.08
9 HEGT00 HELIUM-GT- HEAT	0.	21.	198.	93.	35.	10.	0.	531.	198	COAL-AFB	729.	10	0.03	0.05	0.13
10 FCMCCL FUEL-CL-MO POWR	0.	76.	673.	317.	205.	60.	-264.	0.	673.	COAL	673.	10	0.10	0.30	0.14
10 FCMCCL FUEL-CL-MO HEAT	0.	100.	197.	93.	60.	18.	0.	432.	197.	COAL	650.	10	0.13	0.09	0.14
11 FCSTCL FUEL-CL-ST POWR	0.	166.	583.	249.	205.	60.	-184.	0.	583.	COAL	583.	10	0.22	0.35	0.15
11 FCSTCL FUEL-CL-ST HEAT	0.	131.	217.	93.	76.	22.	0.	401.	217.	COAL	618.	10	0.17	0.12	0.15
12 IGGTST INT-GAS-GT POWR	0.	-69.	818.	376.	205.	60.	-333.	0.	818.	COAL	818.	10	-0.09	0.25	0.11
12 IGGTST INT-GAS-GT HEAT	0.	65.	202.	93.	51.	15.	0.	482.	202.	COAL	684.	10	0.09	0.07	0.14
13 GTSOAR GT-HRSG-10 POWR	0.	43.	706.	281.	205.	60.	-221.	0	706.	RESIDUAL	706.	0	0.06	0.29	0.13
13 GTSOAR GT-HRSG-10 HEAT	0.	87.	234.	93.	68.	20.	0.	428.	234.	RESIDUAL	662.	0	0.12	0.10	0.14
14 GTAC08 GT-HRSG-08 POWR	0.	-9.	758.	391.	205.	60.	-351.	0.	758.	RESIDUAL	758.	0	-0.01	0.27	0.12
14 GTAC08 GT-HRSG-08 HEAT	0.	81.	180.	93.	49.	14.	0.	488.	180.	RESIDUAL	668.	0	0.11	0.07	0.14
15 GTAC12 GT-HRSG-12 POWR	0.	78.	671.	311.	205.	60.	-256.	0.	671.	RESIDUAL	671.	0	0.10	0.31	0.14
15 GTAC12 GT-HRSG-12 HEAT	0.	100.	201.	93.	61.	18.	0.	448.	201.	RESIDUAL	649.	0	0.13	0.09	0.14
16 GTAC16 GT-HRSG-16 POWR	0.	115.	634.	269.	205.	60.	-207.	0.	634.	RESIDUAL	634.	0	0.15	0.32	0.15
16 GTAC16 GT-HRSG-16 HEAT	0.	111.	219.	93.	71.	21.	0.	418.	219.	RESIDUAL	638.	0	0.15	0.11	0.15
17 GTWC16 GT-HRSG-16 POWR	0.	99.	650.	263.	205.	60.	-201.	0.	650.	RESIDUAL	650.	0	0.13	0.32	0.14
17 GTWC16 GT-HRSG-16 HEAT	0.	106.	229.	93.	72.	21.	0.	414.	229.	RESIDUAL	643.	0	0.14	0.11	0.14

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33121 MW 60.00 PROCESS MILLIONS BTU/HR 93.0 PROCESS TEMP(F) 448. PRODUCT SPECIAL-STEE HOURS PER YEAR 6700.

POWER TO HEAT RATIO 2.201

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	168.	581.	195.	205.	60.	-120.	0.	581.	RESIDUAL	581.	0	0.22	0.35	0.16
18 CC1626 GTST-16/26 HEAT	0.	137.	277.	93.	98.	29.	0.	335.	277.	RESIDUAL	612.	0	0.18	0.16	0.15
19 CC1622 GTST-16/22 POWR	0.	156.	593.	218.	205.	60.	-147.	0.	593.	RESIDUAL	593.	0	0.21	0.35	0.16
19 CC1622 GTST-16/22 HEAT	0.	129.	253.	93.	87.	26.	0.	367.	253.	RESIDUAL	620.	10	0.17	0.14	0.15
20 CC1222 GTST-12/22 POWR	0.	157.	593.	220.	205.	60.	-149.	0.	593.	RESIDUAL	593.	0	0.21	0.35	0.16
20 CC1222 GTST-12/22 HEAT	0.	129.	251.	93.	87.	25.	0.	369.	251.	RESIDUAL	620.	0	0.17	0.14	0.15
21 CC0822 GTST-08/22 POWR	0.	106.	644.	282.	205.	60.	-223.	0.	644.	RESIDUAL	644.	0	0.14	0.32	0.14
21 CC0822 GTST-08/22 HEAT	0.	108.	212.	93.	67.	20.	0.	429.	212.	RESIDUAL	641.	0	0.14	0.11	0.15
22 STIG15 STIG-15-16 POWR	0.	111.	537.	7.	205.	60.	101.	0.	639.	RESIDUAL	639.	1	0.15	0.32	0.15
22 STIG15 STIG-15-16 HEAT	0.	1473.	7154.	93.	2726.	799.	0.	-7878.	7154.	RESIDUAL	-724.	1	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	159.	570.	76.	205.	60.	21.	0.	591.	RESIDUAL	591.	1	0.21	0.35	0.16
23 STIG10 STIG-10-16 HEAT	0.	195.	702.	93.	252.	74.	0.	-148.	702.	RESIDUAL	554.	1	0.22	0.36	0.13
24 STIG15 STIG-15-16 POWR	0.	138.	611.	129.	205.	60.	-42.	0.	611.	RESIDUAL	611.	1	0.18	0.34	0.15
24 STIG15 STIG-15-16 HEAT	0.	130.	441.	93.	148.	43.	0.	178.	441.	RESIDUAL	619.	1	0.17	0.24	0.15
25 DEADV3 DIESEL-ADV POWR	0.	197.	552.	94.	205.	60.	-1.	0.	552.	RESIDUAL	552.	0	0.26	0.37	0.17
25 DEADV3 DIESEL-ADV HEAT	0.	196.	546.	93.	203.	59.	0.	7.	546.	RESIDUAL	553.	0	0.26	0.37	0.17
26 DEADV2 DIESEL-ADV POWR	0.	197.	552.	140.	205.	60.	-55.	0.	552.	RESIDUAL	552.	1	0.26	0.37	0.17
26 DEADV2 DIESEL-ADV HEAT	0.	163.	366.	93.	136.	40.	0.	215.	366.	RESIDUAL	581.	1	0.22	0.23	0.16
27 DEADV1 DIESEL-ADV POWR	0.	197.	552.	216.	205.	60.	-144.	0.	552.	RESIDUAL	552.	1	0.26	0.37	0.17
27 DEADV1 DIESEL-ADV HEAT	0.	147.	238.	93.	88.	26.	0.	364.	238.	RESIDUAL	602.	1	0.20	0.15	0.15
28 DEHTPM ADV-DIESEL POWR	0.	48.	701.	301.	205.	60.	-244.	0.	701.	RESIDUAL	701.	0	0.06	0.29	0.13
28 DEHTPM ADV-DIESEL HEAT	0.	90.	217.	93.	63.	19.	0.	442.	217.	RESIDUAL	659.	0	0.12	0.10	0.14
29 DESOA3 DIESEL-SOA POWR	0.	164.	567.	77.	205.	60.	18.	0.	586.	DISTILLA	586.	0	0.22	0.35	0.16
29 DESOA3 DIESEL-SOA HEAT	0.	197.	682.	93.	246.	72.	0.	-130.	682.	DISTILLA	552.	0	0.22	0.36	0.14
29 DESOA3 DIESEL-SOA POWR	0.	164.	567.	77.	205.	60.	18.	0.	586.	RESIDUAL	586.	0	0.22	0.35	0.16
29 DESOA3 DIESEL-SOA HEAT	0.	197.	682.	93.	246.	72.	0.	-130.	682.	RESIDUAL	552.	0	0.22	0.36	0.14

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33121 MW 60.00 PROCESS MILLIONS BTU/HR 93.0 PROCESS TEMP(F) 448. PRODUCT SPECIAL-STEE HOURS PER YEAR 6700.

POWER TO HEAT RATIO 2.201

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	182.	567.	125.	205.	60.	-37.	0.	567.	DISTILLA	567.	1	0.24	0.36	0.16
30 DESOA2 DIESEL-SOA HEAT	0.	164.	423.	93.	153.	45.	0.	163.	423.	DISTILLA	586.	1	0.22	0.26	0.16
30 DESOA2 DIESEL-SOA POWR	0.	182.	567.	125.	205.	60.	-37.	0.	567.	RESIDUAL	567.	1	0.24	0.36	0.16
30 DESOA2 DIESEL-SOA HEAT	0.	164.	423.	93.	153.	45.	0.	163.	423.	RESIDUAL	586.	1	0.22	0.26	0.16
31 DESOA1 DIESEL-SOA POWR	0.	182.	567.	227.	205.	60.	-158.	0.	567.	DISTILLA	567.	1	0.24	0.36	0.16
31 DESOA1 DIESEL-SOA HEAT	0.	139.	232.	93.	84.	25.	0.	378.	232.	DISTILLA	610.	1	0.19	0.14	0.15
31 DESOA1 DIESEL-SOA POWR	0.	182.	567.	227.	205.	60.	-158.	0.	567.	RESIDUAL	567.	1	0.24	0.36	0.16
31 DESOA1 DIESEL-SOA HEAT	0.	139.	232.	93.	84.	25.	0.	378.	232.	RESIDUAL	610.	1	0.19	0.14	0.15
32 GTSOAD GT-HRSG-10 POWR	0.	48.	701.	319.	205.	60.	-266.	0.	701.	DISTILLA	701.	0	0.06	0.29	0.13
32 GTSOAD GT-HRSG-10 HEAT	0.	92.	205.	93.	60.	18.	0.	453.	205.	DISTILLA	658.	0	0.12	0.09	0.14
33 GTRA08 GT-85RE-08 POWR	0.	176.	573.	170.	205.	60.	-91.	0.	573.	DISTILLA	573.	0	0.23	0.36	0.16
33 GTRA08 GT-85RE-08 HEAT	0.	146.	313.	93.	112.	33.	0.	290.	313.	DISTILLA	604.	0	0.19	0.19	0.15
34 GTRA12 GT-85RE-12 POWR	0.	177.	572.	179.	205.	60.	-101.	0.	572.	DISTILLA	572.	0	0.24	0.36	0.16
34 GTRA12 GT-85RE-12 HEAT	0.	145.	297.	93.	106.	31.	0.	308.	297.	DISTILLA	605.	0	0.19	0.18	0.15
35 GTRA16 GT-85RE-16 POWR	0.	163.	587.	196.	205.	60.	-121.	0.	587.	DISTILLA	587.	0	0.22	0.35	0.16
35 GTRA16 GT-85RE-16 HEAT	0.	135.	278.	93.	97.	28.	0.	336.	278.	DISTILLA	615.	0	0.18	0.16	0.15
36 GTR208 GT-60RE-08 POWR	0.	109.	640.	244.	205.	60.	-178.	0.	640.	DISTILLA	640.	0	0.15	0.32	0.15
36 GTR208 GT-60RE-08 HEAT	0.	109.	244.	93.	78.	23.	0.	396.	244.	DISTILLA	640.	0	0.15	0.12	0.15
37 GTR212 GT-60RE-12 POWR	0.	129.	620.	227.	205.	60.	-158.	0.	620.	DISTILLA	620.	0	0.17	0.33	0.15
37 GTR212 GT-60RE-12 HEAT	0.	117.	254.	93.	84.	25.	0.	378.	254.	DISTILLA	632.	0	0.16	0.13	0.15
38 GTR216 GT-60RE-16 POWR	0.	142.	607.	221.	205.	60.	-150.	0.	607.	DISTILLA	607.	0	0.19	0.34	0.15
38 GTR216 GT-60RE-16 HEAT	0.	123.	256.	93.	86.	25.	0.	370.	256.	DISTILLA	626.	0	0.16	0.14	0.15
39 GTRW08 GT-85RE-08 POWR	0.	166.	583.	145.	205.	60.	-61.	0.	583.	DISTILLA	583.	0	0.22	0.35	0.16
39 GTRW08 GT-85RE-08 HEAT	0.	146.	374.	93.	131.	38.	0.	229.	374.	DISTILLA	604.	0	0.19	0.22	0.15
40 GTRW12 GT-85RE-12 POWR	0.	187.	562.	146.	205.	60.	-63.	0.	562.	DISTILLA	562.	0	0.25	0.38	0.17
40 GTRW12 GT-85RE-12 HEAT	0.	159.	358.	93.	130.	38.	0.	233.	358.	DISTILLA	591.	0	0.21	0.22	0.16

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33121 MW 60.00 PROCESS MILLIONS BTU/HR 93.0 PROCESS TEMP(F) 448. PRODUCT SPECIAL-STEE HOURS PER YEAR 6700.

POWER TO HEAT RATIO 2.201

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWFR FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	176.	573.	161.	205.	60.	-80.	0.	573.	DISTILLA	573.	0	0.23	0.36	0.16
41 GTRW16 GT-85RE-16 HEAT	0.	148.	330.	93.	118.	35.	0.	271.	330.	DISTILLA	602.	0	0.20	0.20	0.15
42 GTR308 GT-CORE-08 POWR	0.	89.	660.	193.	205.	60.	-118.	0.	660.	DISTILLA	660.	0	0.12	0.31	0.14
42 GTR308 GT-CORE-08 HEAT	0.	99.	318.	93.	99.	29,	0.	332.	318.	DISTILLA	650.	0	0.13	0.15	0.14
43 GTR312 GT-CORE-12 POWR	0.	151.	599.	192.	205.	60.	-116.	0.	599.	DISTILLA	599.	0	0.20	0.34	0.16
43 GTR312 GT-CORE-12 HEAT	0.	129.	290.	93.	99.	29.	0.	330.	290.	DISTILLA	620.	0	0.17	0.16	0.15
44 GTR316 GT-CORE-16 POWR	0.	145.	604.	195.	205.	60.	-120.	0.	604.	DISTILLA	604.	0	0.19	0.34	0.15
44 GTR316 GT-CORE-16 HEAT	0.	126.	288.	93.	97.	29.	0.	335.	288.	DISTILLA	623.	0	0.17	0.16	0.15
45 FCPADS FUEL-CL-PH POWR	0.	209.	539.	92.	205.	60.	2.	0.	540.	DISTILLA	540.	0	0.28	0.38	0.17
45 FCPADS FUEL-CL-PH HEAT	0.	212.	547.	93.	208.	61.	0.	-10.	547.	DISTILLA	537.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	252.	497.	116.	205.	60.	-27.	0.	497.	DISTILLA	497.	0	0.34	0.41	0.19
46 FCMCDS FUEL-CL-MO HEAT	0.	224.	399.	93.	164.	48.	0.	126.	399.	DISTILLA	525.	0	0.30	0.31	0.18

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33251 MW 280.00 PROCESS MILLIONS BTU/HR 912.0 PROCESS TEMP(F) 448. PRODUCT INTGR-STEEL HOURS PER YEAR 6700.

POWER TO HEAT RATIO 1.048

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 529. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		529.	0.	0.	0.	0.	0.	1073.	2986.	1073.	COAL-FGD	4058.	0	0.	0.24	0.22
1	STM141	STM-TURB-1	POWR	529.	-7209.	11268.	8622.	955.	280.	-9071.	0.	11268.	RESIDUAL	11268.	0	-2.04	0.08	0.08
1	STM141	STM-TURB-1	HEAT	529.	197.	1192.	912.	101.	30.	0.	2670.	1192.	RESIDUAL	3862.	0	0.06	0.03	0.24
1	STM141	STM-TURB-1	POWR	529.	-7209.	11268.	8622.	955.	280.	-9071.	0.	11268.	COAL-FGD	11268.	0	-2.04	0.08	0.08
1	STM141	STM-TURB-1	HEAT	529.	197.	1192.	912.	101.	30.	0.	2670.	1192.	COAL-FGD	3862.	0	0.06	0.03	0.24
1	STM141	STM-TURB-1	POWR	529.	-7209.	11268.	8622.	955.	280.	-9071.	0.	11268.	COAL-AFB	11268.	0	-2.04	0.08	0.08
1	STM141	STM-TURB-1	HEAT	529.	197.	1192.	912.	101.	30.	0.	2670.	1192.	COAL-AFB	3862.	0	0.06	0.03	0.24
2	STM088	STM-TURB-8	POWR	529.	-15597.	19656.	15752.	955.	280	-17459.	0.	19656.	RESIDUAL	19656.	0	-4.42	0.05	0.05
2	STM083	STM-TURB-8	HEAT	529.	108.	1138.	912.	55.	16.	0.	2813.	1138.	RESIDUAL	3951.	0	0.03	0.01	0.23
2	STM083	STM-TURB-8	POWR	529.	-15597.	19656.	15752.	955.	280.	-17459.	0.	19656.	COAL-FGD	19656.	0	-4.42	0.05	0.05
2	STM083	STM-TURB-8	HEAT	529.	108.	1138.	912.	55.	16.	0.	2813.	1138.	COAL FGD	3951.	0	0.03	0.01	0.23
2	STM088	STM-TURB-8	POWR	529.	-15597.	19656.	15752.	955.	280.	-17459.	0.	19656.	COAL-AFB	19656.	0	-4.42	0.05	0.05
2	STM088	STM-TURB-8	HEAT	529.	108.	1138.	912.	55.	16.	0.	2813.	1138.	COAL-AFB	3951.	0	0.03	0.01	0.23
3	PFBSTM	PFB-STMTB-	POWR	529.	-1968.	6026.	4098.	955.	280.	-3748.	0.	6026.	COAL-PFB	6026.	0	-0.56	0.18	0.15
3	PFBSTM	PFB-STMTB-	HEAT	529.	396.	1341.	912.	213.	62.	0.	2321.	1341.	COAL-PFB	3662.	0	0.11	0.06	0.25
4	TISTMT	TI-STMTB-1	POWR	0.	-492.	4550.	2881.	955.	280.	-2316.	0.	4550.	RESIDUAL	4550.	0	-0.29	0.21	0.20
4	TISTMT	TI-STMTB-1	HEAT	529.	293.	730.	462.	153.	45.	529.	2507.	1259.	RESIDUAL	3766.	0	0.08	0.04	0.24
4	TISTMT	TI-STMTB-1	POWR	529.	-492.	4550.	2881.	955.	280.	-2316.	0.	4550.	COAL	4550.	0	-0.14	0.21	0.20
4	TISTMT	TI-STMTB-1	HEAT	529.	578.	1441.	912.	302.	89.	0.	2040.	1441.	COAL	3481.	0	0.16	0.09	0.26
5	TIHRSG	THERMIONIC	POWR	0.	-2732.	6790.	4178.	955.	280.	-3842.	0.	6790.	RESIDUAL	6790.	0	-0.92	0.14	0.13
5	TIHRSG	THERMIONIC	HEAT	529.	123.	751.	462.	106.	31.	529.	2655.	1280.	RESIDUAL	3936.	0	0.03	0.03	0.23
5	TIHRSG	THERMIONIC	POWR	529.	-2732.	6790.	4178.	955.	280.	-3842.	0.	6790.	COAL	6790.	0	-0.77	0.14	0.13
5	TIHRSG	THERMIONIC	HEAT	529.	242.	1482.	912.	209.	61.	0.	2334.	1482.	COAL	3816.	0	0.07	0.05	0.24
6	STIRL	STIRLING-1	POWR	0.	-81.	4139.	2061.	955.	280.	-1352.	0.	4139.	DISTILLA	4139.	0	-0.17	0.23	0.22
6	STIRL	STIRLING-1	HEAT	529.	285.	928.	462.	214.	63.	529.	2316.	1457.	DISTILLA	3773.	0	0.08	0.06	0.24

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33251 MW 280.00 PROCESS MILLIONS BTU/HR 912.0 PROCESS TEMP(F) 448. PRODUCT INTGR-STEEL HOURS PER YEAR 6700.

POWER TO HEAT RATIO 1.048

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6* 529. HOT WATER BTU*10**6* 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	-81.	4139.	2061.	955.	280.	-1352.	0.	4139.	RESIDUAL	4139.	0	-0.17	0.23	[illegible]
6	STIRL	STIRLING-1	HEAT	529.	285.	928.	462.	214.	63.	529.	2316.	1457.	RESIDUAL	3773.	0	0.08	0.06	0.24
6	STIRL	STIRLING-1	POWR	529.	-81.	4139.	2061.	955.	280.	-1352.	0.	4139.	COAL	4139.	0	-0.02	0.23	0.22
6	STIRL	STIRLING-1	HEAT	529.	562.	1831.	912.	423.	124.	0.	1665.	1831.	COAL	3496.	0	0.16	0.12	0.26
7	HEGT85	HELIUM-GT-	POWR	529.	-54.	2976.	-54.	955.	280.	1136.	0.	4112.	COAL-AFB	4112.	1	-0.02	0.23	0.22
7	HEGT85	HELIUM-GT-	HEAT	-50616.	915.	-50616.	912.	-16248.	-4762.	0.	53760.	-50516.	COAL-AFB	3144.	11	**.**	-5.17	0.29
8	HEGT60	HELIUM-GT-	POWR	529.	174.	3689.	746.	955.	280.	196.	0.	3884.	COAL-AFB	3884.	0	0.05	0.25	0.23
8	HEGT60	HELIUM-GT-	HEAT	529.	213.	4511.	912.	1168.	342.	0.	-666.	4511.	COAL-AFB	3845.	0	0.05	0.26	0.20
9	HEGT00	HELIUM-GT-	POWR	529.	-1370.	5428.	2555.	955.	280.	-1933.	0.	5428.	COAL-AFB	5428.	0	-0.39	0.18	0.17
9	HEGT00	HELIUM-GT-	HEAT	529.	201.	1937.	912.	341.	100.	0.	1920.	1937.	COAL-AFB	3857.	0	0.06	0.09	0.24
10	FCMCCL	FUEL-CL-MO	POWR	0.	916.	3143.	1481.	955.	280.	-670.	0.	3143.	COAL	3143.	0	0.11	0.30	0.29
10	FCMCCL	FUEL-CL-MO	HEAT	0.	976.	1935.	912.	588.	172.	0.	1147.	1935.	COAL	3082.	0	0.13	0.19	0.30
11	FCSTCL	FUEL-CL-ST	POWR	0.	1341.	2717.	1161.	955.	280.	-293.	0.	2717.	COAL	2717.	0	0.23	0.35	0.34
11	FCSTCL	FUEL-CL-ST	HEAT	0.	1284.	2133.	912.	750.	220.	0.	641.	2133.	COAL	2775.	0	0.21	0.27	0.33
12	IGGTST	INT-GAS-GT	POWR	0.	245.	3813.	1752.	955.	280.	-988.	0.	3813.	COAL	3813.	0	-0.08	0.25	0.24
12	IGGTST	INT-GAS-GT	HEAT	0.	642.	1985.	912.	497.	146.	0.	1431.	1985.	COAL	3416.	0	0.03	0.15	0.27
13	GTSOAR	GT-HRSG-10	POWR	0.	764.	3294.	1309.	955.	280.	-467.	0.	3294.	RESIDUAL	3294.	0	0.07	0.29	0.28
13	GTSOAR	GT-HRSG-10	HEAT	529.	435.	1163.	462.	337.	99.	529.	1932.	1692.	RESIDUAL	3624.	0	0.12	0.09	0.25
14	GTAC08	GT-HRSG-08	POWR	0.	520.	3538.	1826.	955.	280.	-1075.	0.	3538.	RESIDUAL	3538.	0	-0.00	0.27	0.26
14	GTAC08	GT-HRSG-08	HEAT	529.	404.	895.	462.	242.	71.	529.	2230.	1425.	RESIDUAL	3655.	0	0.11	0.07	0.25
15	GTAC12	GT-HRSG-12	POWR	0.	926.	3132.	1450.	955.	280.	-632.	0.	3132.	RESIDUAL	3132.	0	0.11	0.31	0.29
15	GTAC12	GT-HRSG-12	HEAT	529.	497.	998.	462.	304.	89.	529.	2034.	1528.	RESIDUAL	3562.	0	0.14	0.09	0.26
16	GTAC16	GT-HRSG-16	POWR	0.	1101.	2958.	1254.	955.	280.	-402.	0.	2958.	RESIDUAL	2958.	0	0.16	0.32	0.31
16	GTAC16	GT-HRSG-16	HEAT	529.	554.	1090.	462.	352.	103.	529.	1885.	1619.	RESIDUAL	3505.	0	0.16	0.10	0.26
17	GTWC16	GT-HRSG-16	POWR	0.	1026.	3033.	1229.	955.	280.	-373.	0.	3033.	RESIDUAL	3033.	0	0.14	0.32	0.30
17	GTWC16	GT-HRSG-16	HEAT	529.	526.	1140.	462.	359.	105.	529.	1863.	1669.	RESIDUAL	3533.	0	0.15	0.10	0.26

DATE 06/06/79 GENERAL ELECTRIC COMPANY

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33251 MW 280.00 PROCESS MILLIONS BTU/HR 912.0 PROCESS TEMP(F) 448. PRODUCT INTGR-STEEL HOURS PER YEAR 6700.

POWER TO HEAT RATIO 1.048

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 529. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	4.	1344.	2711.	909.	955.	280.	4.	0.	2715.	RESIDUAL	2715.	0	0.23	0.35	0.34
18 CC1626 GTST-16/26 HEAT	529.	683.	1378.	462.	486.	142.	529.	1467.	1908.	RESIDUAL	3375.	0	0.19	0.14	0.27
19 CC1622 GTST-16/22 POWR	0.	1292.	2766.	1015.	955.	280.	-121.	0.	2766.	RESIDUAL	2766.	0	0.22	0.35	0.33
19 CC1622 GTST-16/22 HEAT	529.	643.	1259.	462.	435.	127.	529.	1627.	1789.	RESIDUAL	3415.	0	0.18	0.13	0.27
20 CC1222 GTST-12/22 POWR	0.	1296.	2763.	1024.	955.	280.	-132.	0.	2763.	RESIDUAL	2763.	0	0.22	0.35	0.33
20 CC1222 GTST-12/22 HEAT	529.	644.	1247.	462.	431.	126.	529.	1638.	1776.	RESIDUAL	3414.	0	0.18	0.13	0.27
21 CC0822 GTST-08/22 POWR	0.	1058.	3000.	1316.	955.	280.	-475.	0.	3000.	RESIDUAL	3000.	0	0.15	0.32	0.30
21 CC0822 GTST-08/22 HEAT	529.	538.	1053.	462.	335.	98.	529.	1937.	1583.	RESIDUAL	3520.	0	0.15	0.10	0.26
22 STIG15 STIG-15-16 POWR	529.	516.	2508.	33.	955.	280.	1035.	0.	3542.	RESIDUAL	3542.	1	0.15	0.27	0.26
22 STIG15 STIG-15-16 HEAT	529.	7318.	35538.	462.	13540.	3968.	529.	-39327.	36068.	RESIDUAL	-3260.	1	0.17	0.38	0.03
23 STIG10 STIG-10-16 POWR	529.	740.	2660.	353.	955.	280.	558.	0.	3319.	RESIDUAL	3319.	1	0.21	0.29	0.27
23 STIG10 STIG-10-16 HEAT	529.	970.	3487.	462.	1252.	367.	529.	-927.	4016.	RESIDUAL	3089.	1	0.22	0.31	0.23
24 STIG1S STIG-1S-16 POWR	366.	342.	2850.	601.	955.	280.	366.	0.	3216.	RESIDUAL	3216.	1	0.19	0.30	0.28
24 STIG1S STIG-1S-16 HEAT	529.	648.	2192.	462.	735.	215.	529.	690.	2721.	RESIDUAL	3411.	1	0.18	0.22	0.27
25 DEADV3 DIESEL-ADV POWR	529.	926.	2575.	439.	955.	280.	557.	0	3132.	RESIDUAL	3132.	0	0.26	0.31	0.29
25 DEADV3 DIESEL-ADV HEAT	529.	976.	2713.	462.	1006.	295.	529.	-160.	3242.	RESIDUAL	3083.	0	0.26	0.31	0.28
26 DEADV2 DIESEL-ADV POWR	303.	1180.	2575.	654.	955.	280.	303.	0.	2879.	RESIDUAL	2879.	1	0.27	0.33	0.32
26 DEADV2 DIESEL-ADV HEAT	529.	833.	1819.	462.	675.	198.	529.	877.	2348.	RESIDUAL	3225.	1	0.24	0.21	0.28
27 DEADV1 DIESEL-ADV POWR	0.	1483.	2575.	1007.	955.	280.	-112.	0.	2575.	RESIDUAL	2575.	1	0.27	0.37	0.35
27 DEADV1 DIESEL-ADV HEAT	529.	732.	1182.	462.	438.	128.	529.	1616.	1711.	RESIDUAL	3327.	1	0.21	0.13	0.27
28 DEHTPM ADV-DIESEL POWR	0.	787.	3272.	1403.	955.	280.	-577.	0.	3272.	RESIDUAL	3272.	0	0.07	0.29	0.28
28 DEHTPM ADV-DIESEL HEAT	529.	449.	1078.	462.	315.	92.	529.	2002.	1607.	RESIDUAL	3609.	0	0.13	0.09	0.25
29 DESOA3 DIESEL-SOA POWR	529.	763.	2646.	361.	955.	280.	649.	0.	3295.	DISTILLA	3295.	0	0.22	0.29	0.28
29 DESOA3 DIESEL-SOA HEAT	529.	978.	3390.	462.	1224.	359.	529.	-838.	3919.	DISTILLA	3081.	0	0.22	0.31	0.23
29 DESOA3 DIESEL-SOA POWR	529.	763.	2646.	361.	955.	280.	649.	0.	3295.	RESIDUAL	3295.	0	0.22	0.29	0.28
29 DESOA3 DIESEL-SOA HEAT	529.	978.	3390.	462.	1224.	359.	529.	-838.	3919.	RESIDUAL	3081.	0	0.22	0.31	0.23

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33251 MW 280.00 PROCESS MILLIONS BTU/HR 912.0 PROCESS TEMP(F) 448. PRODUCT INTGR-STEEL HOURS PER YEAR 6700.

POWER TO HEAT RATIO 1.048

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 529. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	388.	1024.	2646.	582.	955.	280.	388.	0.	3034.	DISTILLA	3034.	1	0.25	0.31	0.30
30 DESOA2 DIESEL-SOA HEAT	529.	813.	2100.	462.	758.	222.	529.	616.	2629.	DISTILLA	3246.	1	0.23	0.23	0.28
30 DESOA2 DIESEL-SOA POWR	388.	1024.	2646.	582.	955.	280.	388.	0.	3034.	RESIDUAL	3034.	1	0.25	0.31	0.30
30 DESOA2 DIESEL-SOA HEAT	529.	813.	2100.	462.	758.	222.	529.	616.	2629.	RESIDUAL	3246.	1	0.23	0.23	0.28
31 DESOA1 DIESEL-SOA POWR	0.	1412.	2646.	1061.	955.	280.	-176.	0.	2646.	DISTILLA	2646.	1	0.25	0.36	0.34
31 DESOA1 DIESEL-SOA HEAT	529.	691.	1152.	462.	416.	122.	529.	1686.	1682.	DISTILLA	3367.	1	0.20	0.12	0.27
31 DESOA1 DIESEL-SOA POWR	0.	1412.	2646.	1061.	955.	280.	-176.	0.	2646.	RESIDUAL	2646.	1	0.25	0.36	0.34
31 DESOA1 DIESEL-SOA HEAT	529.	691.	1152.	462.	416.	122.	529.	1686.	1682.	RESIDUAL	3367.	1	0.20	0.12	0.27
32 GTSOAD GT-HRSG-10 POWR	0.	787.	3272.	1488.	955.	280.	-677.	0.	3272.	DISTILLA	3272.	0	0.07	0.29	0.28
32 GTSOAD GT-HRSG-10 HEAT	529.	455.	1016.	462.	297.	87.	529.	2058.	1545.	DISTILLA	3604.	0	0.13	0.08	0.25
33 GTRA08 GT-85RE-08 POWR	138.	1245.	2676.	795.	955.	280.	138.	0.	2814.	DISTILLA	2814.	0	0.24	0.34	0.32
33 GTRA08 GT-85RE-08 HEAT	529.	723.	1555.	462.	555.	163.	529.	1250.	[illegible]	DISTILLA	3335.	0	0.20	0.17	0.27
34 GTRA12 GT-85RE-12 POWR	89.	1301.	2669.	837.	955.	280.	89.	0.	2757.	DISTILLA	2757.	0	0.24	0.35	0.33
34 GTRA12 GT-85RE-12 HEAT	529.	719.	1474.	462.	528.	155.	529.	1337.	2003.	DISTILLA	3340.	0	0.20	0.16	0.27
35 GTRA16 GT-85RE-16 POWR	0.	1321.	2737.	915.	955.	280.	-4.	0.	2737.	DISTILLA	2737.	0	0.22	0.35	0.33
35 GTRA16 GT-85RE-16 HEAT	529.	669.	1382.	462.	482.	141.	529.	1478.	1912.	DISTILLA	3390.	0	0.19	0.14	0.27
36 GTR208 GT-60RE-08 POWR	0.	1073.	2986.	1138.	955.	280.	-266.	0.	2986.	DISTILLA	2986.	0	0.15	0.32	0.31
36 GTR208 GT-60RE-08 HEAT	529.	544.	1212.	462.	388.	114.	529.	1774.	1741.	DISTILLA	3515.	0	0.15	0.11	0.26
37 GTR212 GT-60RE-12 POWR	0.	1163.	2895.	1060.	955.	280.	-175.	0.	2895.	DISTILLA	2895.	0	0.18	0.33	0.32
37 GTR212 GT-60RE-12 HEAT	529.	583.	1261.	462.	416.	122.	529.	1685.	1791.	DISTILLA	3475.	0	0.17	0.12	0.26
38 GTR216 GT-60RE-16 POWR	0.	1224.	2835.	1030.	955.	280.	-139.	0.	2835.	DISTILLA	2835.	0	0.20	0.34	0.32
38 GTR216 GT-60RE-16 HEAT	529.	611.	1271.	462.	428.	126.	529.	1647.	1800.	DISTILLA	3447.	0	0.17	0.12	0.26
39 GTRW08 GT-85RE-08 POWR	277.	1060.	2722.	677.	955.	280.	277.	0.	2999.	DISTILLA	2999.	0	0.23	0.32	0.30
39 GTRW08 GT-85RE-08 HEAT	529.	724.	1859.	462.	652.	191.	529.	947.	2368.	DISTILLA	3335.	0	0.21	0.20	0.27
40 GTRW12 GT-85RE-12 POWR	270.	1163.	2625.	682.	955.	280.	270.	0.	2895.	DISTILLA	2895.	0	0.26	0.33	0.32
40 GTRW12 GT-85RE-12 HEAT	529.	788.	1778.	462.	647.	190.	529.	963.	2307.	DISTILLA	3270.	0	0.22	0.20	0.28

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I8SE REQ ADJ DESIGN ENGR REPORT 5 1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33?51 MW 280 00 PROCESS MILLIONS BTU/HR 912 0 PROCESS TEMP(F) 448 PRODUCT INTGR-STEEL HOURS PER YEAR 6700

POWER TO HEAT RATIO 1 048

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 529 HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85PE-16 POWR	187.	1195	2676	753	955.	280	187.	0.	2863	DISTILLA	2863.	0	0 24	0 33	0 32
41 GTRW16 GT-85PE-16 HEAT	529.	733	1642	462.	586.	172.	529	1154	2171	DISTILLA	3325.	0	0 21	0 18	0 27
42 GTR308 GT-60PE-08 POWR	12.	965	3082	902	955.	280.	12.	0	3094	DISTILLA	3094.	0	0 13	0 31	0 29
42 GTR308 GT-60PE-08 HEAT	529.	434	1579	462	489	143.	529.	1456	2108	DISTILLA	3564.	0	0 14	0 14	0 26
43 GTR312 GT-60PE-12 POWR	19.	1246	2793	836	955	280.	19.	0	2812	DISTILLA	2812.	0	0 21	0 34	0 32
43 GTR312 GT-60PE-12 HEAT	529	643	1441	462	493	144	529	1446	1970	DISTILLA	3416.	0	0 18	0 14	0 27
44 GTR316 GT-60PE-16 POWR	1.	1240	2818.	911.	955	280.	1.	0	2819	DISTILLA	2819.	0	0 20	0 34	0 32
44 GTR316 GT-60PE-16 HEAT	529	628	1429	462	484	142.	529	1472	1958	DISTILLA	3430.	0	0 18	0 14	0 27
45 FCPADS FUEL-CL-PH POWR	529.	374	2514.	427.	955	280	570	0.	3084	DISTILLA	3084.	0	0 28	0 31	0 30
45 FCPADS FUEL-CL-PH HEAT	529.	1053	2718	462	1033	303.	529	-242	3247	DISTILLA	3005.	0	0 28	0 32	0 28
46 FCMCDS FUEL-CL-MO POWR	437.	1302	2319.	540.	955.	280	437	0	2756	DISTILLA	2756.	0	0 34	0 35	0 33
46 FCMCDS FUEL-CL-MO HEAT	529.	1114	1583.	462.	817	239.	529.	433	2512	DISTILLA	2945.	0	0 32	0 26	0 31

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PRO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33254 MW 40.00 PROCESS MILLIONS BTU/HR 91.0 PROCESS TEMP(F) 448. PRODUCT MINI-STEEL HOURS PER YEAR 6700

POWER TO HEAT RATIO 1.500

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	107.	427.	107.	COAL-AFB	534.	0	0.	0.26	0.17
1 STM141 STM-TURB-1 POWR	0.	-1087.	1621.	1241.	136.	40.	-1353.	0.	1621.	RESIDUAL	1621.	0	-2.04	0.08	0.06
1 STM141 STM-TURB-1 HEAT	0.	19.	119.	91.	10.	3.	0.	395.	119.	RESIDUAL	514.	10	0.04	0.02	0.18
1 STM141 STM-TURB-1 POWR	0.	-1087.	1621.	1241.	136.	40.	-1353.	0.	1621.	COAL-FGD	1621.	0	-2.04	0.08	0.06
1 STM141 STM-TURB-1 HEAT	0.	19.	119.	91.	10.	3.	0.	395.	119.	COAL-FGD	514.	10	0.04	0.02	0.18
1 STM141 STM-TURB-1 POWR	0.	-1087.	1621.	1241.	136.	40.	-1353.	0.	1621.	COAL-AFB	1621.	0	-2.04	0.08	0.06
1 STM141 STM-TURB-1 HEAT	0.	19.	119.	91.	10.	3.	0.	395.	119.	COAL-AFB	514.	10	0.04	0.02	0.18
2 STM088 STM-TURB-8 POWR	0.	-2309.	2843.	2280.	136.	40.	-2575.	0.	2843.	RESIDUAL	2843.	0	-4.33	0.05	0.03
2 STM088 STM-TURB-8 HEAT	0.	11.	113.	91.	5.	2.	0.	409.	113.	RESIDUAL	523.	10	0.02	0.01	0.17
2 STM088 STM-TURB-8 POWR	0.	-2309.	2843.	2280.	136.	40.	-2575.	0.	2843.	COAL-FGD	2843.	0	-4.33	0.05	0.03
2 STM088 STM-TURB-8 HEAT	0.	11.	113.	91.	5.	2.	0.	409.	113.	COAL-FGD	523.	10	0.02	0.01	0.17
2 STM088 STM-TURB-8 POWR	0.	-2309.	2843.	2280.	136.	40.	-2575.	0.	2843.	COAL-AFB	2843.	0	-4.33	0.05	0.03
2 STM088 STM-TURB-8 HEAT	0.	11.	113.	91.	5.	2	0.	409.	113.	COAL-AFB	523.	10	0.02	0.01	0.17
3 PFBSTM PFB-STMTB- POWR	0.	-330.	864.	588.	136.	40.	-584.	0.	864.	COAL-PFB	864.	0	-0.62	0.16	0.11
3 PFBSTM PFB-STMTB- HEAT	0.	39.	134.	91.	21.	6.	0.	360.	134.	COAL-PFB	494.	10	0.07	0.04	0.18
4 TISTMT TI-STMTB-1 POWR	0.	-118.	652.	413.	136.	40.	-379.	0.	652.	RESIDUAL	652.	0	-0.22	0.21	0.14
4 TISTMT TI-STMTB-1 HEAT	0.	57.	144.	91.	30.	9.	0.	332.	144.	RESIDUAL	476.	10	0.11	0.06	0.19
4 TISTMT TI-STMTB-1 POWR	0.	-118.	652.	413.	136.	40.	-379.	0.	652.	COAL	652.	0	-0.22	0.21	0.14
4 TISTMT TI-STMTB-1 HEAT	0.	57.	144.	91.	30.	9.	0.	332.	144.	COAL	476.	10	0.11	0.06	0.19
5 TIHRSG THERMIONIC POWR	0.	-436.	970.	597.	136.	40.	-595.	0.	970.	RESIDUAL	970.	0	-0.82	0.14	0.09
5 TIHRSG THERMIONIC HEAT	0.	24.	148.	91.	21.	6.	0	361.	148.	RESIDUAL	509.	0	0.05	0.04	0.18
5 TIHRSG THERMIONIC POWR	0.	-436.	970.	597.	136.	40.	-595.	0.	970.	COAL	970.	0	-0.82	0.14	0.09
5 TIHRSG THERMIONIC HEAT	0.	24.	148.	91.	21.	6.	0.	361.	148.	COAL	509.	0	0.05	0.04	0.18
6 STIRL STIRLING-1 POWR	0.	-58.	591.	294.	136.	40.	-239.	0.	591.	DISTILLA	591.	0	-0.11	0.23	0.15
6 STIRL STIRLING-1 HEAT	0.	56.	183.	91.	42.	12.	0.	295.	183.	DISTILLA	477.	0	0.11	0.09	0.19

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33254 MW 40.00 PROCESS MILLIONS BTU/HR 91.0 PROCESS TEMP(F) 448. PRODUCT MINI-STEEL HOURS PER YEAR 6700.

POWER TO HEAT RATIO 1.500

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL	STIRLING-1	POWR	0.	-58.	591.	294.	136.	40.	-239.	0.	591.	RESIDUAL	591.	0	-0.11	0.23	0.15
6 STIRL	STIRLING-1	HEAT	0.	56.	183.	91.	42.	12.	0.	295.	183.	RESIDUAL	477.	0	0.11	0.09	0.19
6 STIRL	STIRLING-1	POWR	0.	-58.	591.	294.	136.	40.	-239.	0.	591.	COAL	591.	0	-0.11	0.23	0.15
6 STIRL	STIRLING-1	HEAT	0.	56.	183.	91.	42.	12.	0.	295.	183.	COAL	477.	0	0.11	0.09	0.19
7 HEGT85	HELIUM-GT-	POWR	0.	-8.	425.	-8.	136.	40.	116.	0.	541.	COAL-AFB	541.	11	-0.01	0.25	0.17
7 HEGT85	HELIUM-GT-	HEAT	-5051.	91.	-5051.	91.	-1621.	-475.	0.	5493.	-5051.	COAL-AFB	442.	11	-9.29	-3.67	0.21
8 HEGT60	HELIUM-GT-	POWR	0.	7.	527.	107.	136.	40.	-18.	0.	527.	COAL-AFB	527.	10	0.01	0.26	0.17
8 HEGT60	HELIUM-GT-	HEAT	0.	21.	450.	91.	117.	34.	0.	62.	450.	COAL-AFB	512.	10	0.04	0.23	0.18
9 HEGT00	HELIUM-GT-	POWR	0.	-242.	775.	365.	136.	40.	-322.	0.	775.	COAL-AFB	775.	10	-0.45	0.18	0.12
9 HEGT00	HELIUM-GT-	HEAT	0.	20.	193.	91.	34.	10.	0.	320.	193.	COAL-AFB	513.	10	0.04	0.07	0.18
10 FCMCCL	FUEL-CL-MO	POWR	0.	85.	449.	212.	136.	40.	-142.	0.	449.	COAL	449.	10	0.16	0.30	0.20
10 FCMCCL	FUEL-CL-MO	HEAT	0.	97.	193.	91.	59.	17.	0.	243.	193.	COAL	436.	10	0.18	0.13	0.21
11 FCSTCL	FUEL-CL-ST	POWR	0.	145.	388.	166.	136.	40.	-88.	0.	388.	COAL	388.	10	0.27	0.35	0.23
11 FCSTCL	FUEL-CL-ST	HEAT	0.	128.	213.	91.	75.	22.	0.	193.	213.	COAL	406.	10	0.24	0.18	0.22
12 IGGTST	INT-GAS-GT	POWR	0.	-12.	545.	251.	136.	40.	-188.	0.	545.	COAL	545.	10	-0.02	0.25	0.17
12 IGGTST	INT-GAS-GT	HEAT	0.	64.	198.	91.	50.	15.	0.	272.	198.	COAL	470.	10	0.12	0.11	0.19
13 GTSOAR	GT-HRSG-10	POWR	0.	63.	471.	187.	136.	40.	-113.	0.	471.	RESIDUAL	471.	0	0.12	0.29	0.19
13 GTSOAR	GT-HRSG-10	HEAT	0.	86.	229.	91.	65.	19.	0.	219.	229.	RESIDUAL	448.	0	0.16	0.15	0.20
14 GTAC08	GT-HRSG-08	POWR	0.	28.	505.	261.	136.	40.	-200.	0.	505.	RESIDUAL	505.	0	0.05	0.27	0.18
14 GTAC08	GT-HRSG-08	HEAT	0.	80.	176.	91.	48.	14.	0.	278.	176.	RESIDUAL	454.	10	0.15	0.10	0.20
15 GTAC12	GT-HRSG-12	POWR	0.	86.	447.	207.	136.	40.	-137.	0.	447.	RESIDUAL	447.	0	0.16	0.31	0.20
15 GTAC12	GT-HRSG-12	HEAT	0.	98.	197.	91.	60.	18.	0.	239.	197.	RESIDUAL	436.	0	0.18	0.14	0.21
16 GTAC16	GT-HRSG-16	POWR	0.	111.	423.	179.	136.	40.	-104.	0.	423.	RESIDUAL	423.	0	0.21	0.32	0.22
16 GTAC16	GT-HRSG-16	HEAT	0.	109.	215.	91.	69.	20.	0.	210.	215.	RESIDUAL	424.	0	0.20	0.16	0.21
17 GTWC16	GT-HRSG-16	POWR	0.	100.	433.	176.	136.	40.	-100.	0.	433.	RESIDUAL	433.	0	0.19	0.32	0.21
17 GTWC16	GT-HRSG-16	HEAT	0.	104.	225.	91.	71.	21.	0.	205.	225.	RESIDUAL	430.	0	0.19	0.16	0.21

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PFO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33254 MW 40.00 PROCESS MILLIONS BTU/HR 91.0 PROCESS TEMP(F) 448. PRODUCT MINI-STEEL HOURS PER YEAR 6700

POWER TO HEAT RATIO 1.500

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626	GTST-16/26	POWR	0.	146.	388.	130.	136.	40.	-46.	0	388	RESIDUAL	388.	0	0.27	0.35	0.23
18 CC1626	GTST-16/26	HEAT	0.	134.	271.	91.	96.	28.	0.	128.	271	RESIDUAL	399.	0	0.25	0.24	0.23
19 CC1622	GTST-16/22	POWR	0.	138.	395.	145.	136.	40.	-64.	0.	395	RESIDUAL	395.	0	0.26	0.35	0.23
19 CC1622	GTST-16/22	HEAT	0.	126.	248.	91.	86.	25.	0.	159.	248.	RESIDUAL	407.	10	0.24	0.21	0.22
20 CC1222	GTST-12/22	POWR	0.	139.	395.	147.	136.	40.	-65.	0.	395.	RESIDUAL	395.	0	0.26	0.35	0.23
20 CC1222	GTST-12/22	HEAT	0.	127.	245.	91.	85.	25.	0.	162.	245.	RESIDUAL	407.	0	0.24	0.21	0.22
21 CC0822	GTST-08/22	POWR	0.	105.	429.	188.	136.	40.	-114.	0.	429.	RESIDUAL	429.	0	0.20	0.32	0.21
21 CC0822	GTST-08/22	HEAT	0.	106.	207.	91.	66.	19.	0.	220	207.	RESIDUAL	428.	0	0.20	0.15	0.21
22 STIG15	STIG-15-16	POWR	0.	74.	358.	5.	136.	40.	102.	0.	460.	RESIDUAL	460.	1	0.14	0.30	0.20
22 STIG15	STIG-15-16	HEAT	0.	1441.	7000.	91.	2667.	782.	0.	-7908.	7000.	RESIDUAL	-908.	1	0.17	0.38	0.01
23 STIG10	STIG-10-16	POWR	0.	106.	330.	50.	136.	40.	48.	0.	428.	RESIDUAL	428.	1	0.20	0.32	0.21
23 STIG10	STIG-10-16	HEAT	0.	191.	687.	91.	247.	72.	0.	-344.	687.	RESIDUAL	343.	1	0.22	0.36	0.13
24 STIG15	STIG-15-16	POWR	0.	120.	407.	66.	136.	40.	6.	0.	413.	RESIDUAL	413.	1	0.23	0.33	0.22
24 STIG15	STIG-15-16	HEAT	0.	128.	432.	91.	145.	42.	0.	-26.	432.	RESIDUAL	406.	1	0.23	0.34	0.21
25 DEADV3	DIESEL-ADV	POWR	0.	132.	368.	63.	136.	40.	33.	0.	401.	RESIDUAL	401.	0	0.25	0.34	0.23
25 DEADV3	DIESEL-ADV	HEAT	0.	192.	534.	91.	198.	58.	0.	-193.	534.	RESIDUAL	341.	0	0.26	0.37	0.17
26 DEADV2	DIESEL-ADV	POWR	0.	166.	368.	93.	136.	40.	-3.	0.	368.	RESIDUAL	368.	1	0.31	0.37	0.25
26 DEADV2	DIESEL-ADV	HEAT	0.	164.	358.	91.	133.	39.	0.	11.	358.	RESIDUAL	369.	1	0.31	0.36	0.25
27 DEADV1	DIESEL-ADV	POWR	0.	166.	358.	144.	136.	40.	-62.	0.	368.	RESIDUAL	368.	1	0.31	0.37	0.25
27 DEADV1	DIESEL-ADV	HEAT	0.	144.	233.	91.	86.	25.	0.	157.	233.	RESIDUAL	38[illegible]	1	0.27	0.22	0.23
28 DEHTPM	ADV-DIESEL	POWR	0.	66.	467.	200.	136.	40.	-129.	0.	467.	RESIDUAL	467.	0	0.12	0.29	0.19
28 DEHTPM	ADV-DIESEL	HEAT	0.	89.	212.	91.	62.	18.	0.	233.	212.	RESIDUAL	445.	0	0.17	0.14	0.20
29 DESOA3	DIESEL-SOA	POWR	0.	109.	378.	52.	136.	40.	46.	0.	424.	DISTILLA	424.	0	0.20	0.32	0.21
29 DESOA3	DIESEL-SOA	HEAT	0.	193.	668.	91.	241.	71.	0.	-327.	668.	DISTILLA	341.	0	0.22	0.36	0.14
29 DESOA3	DIESEL-SOA	POWR	0.	109.	378.	52.	136.	40.	46.	0.	424.	RESIDUAL	424.	0	0.20	0.32	0.21
29 DESOA3	DIESEL-SOA	HEAT	0.	193.	668.	91.	241.	71.	0.	-327.	668.	RESIDUAL	341.	0	0.22	0.36	0.14

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

185E PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33254 MW 40.00 PROCESS MILLIONS BTU/HR 91.0 PROCESS TEMP(F) 448 PRODUCT MINI-STEEL HOURS PER YEAR 6700

POWER TO HEAT RATIO 1.500

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	146.	378.	83.	136.	40.	9.	0.	387	DISTILLA	387.	1	0.27	0.35	0.23
30 DESOA2 DIESEL-SOA HEAT	0.	160.	414.	91.	149.	44.	0	-40	414	DISTILLA	374.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	146.	378.	83.	136.	40.	9	0.	387	RESIDUAL	387.	1	0.27	0.35	0.23
30 DESOA2 DIESEL-SOA HEAT	0.	160.	414.	91.	149.	44.	0.	-40.	414	RESIDUAL	374.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	155.	378.	152.	136.	40.	-71	0	378	DISTILLA	378.	1	0.29	0.35	0.24
31 DESOA1 DIESEL-SOA HEAT	0.	136.	227.	91.	82.	24.	0.	170	227	DISTILLA	397.	1	0.26	0.21	0.23
31 DESOA1 DIESEL-SOA POWR	0.	155.	378.	152.	136.	40.	-71	0.	378	RESIDUAL	378.	1	0.29	0.36	0.24
31 DESOA1 DIESEL-SOA HEAT	0.	136.	227.	91.	82.	24.	0.	170.	227	RESIDUAL	397.	1	0.26	0.21	0.23
32 GTSOAD GT-HRSG-10 POWR	0.	66.	467.	213.	136.	40.	-143	0.	467	DISTILLA	467.	0	0.12	0.29	0.19
32 GTSOAD GT-HRSG-10 HEAT	0.	90.	200.	91.	58.	17.	0	244	200	DISTILLA	444.	0	0.17	0.13	0.20
33 GTRA08 GT-SCPE-08 POWR	0.	151.	382.	114.	136.	40.	-27	0.	382	DISTILLA	382.	0	0.28	0.36	0.24
33 GTRA08 GT-SCPE-08 HEAT	0.	142.	306.	91.	109.	32.	0	85.	306	DISTILLA	391.	0	0.27	0.28	0.23
34 GTRA12 GT-SCPE-12 POWR	0.	152.	381.	120.	136.	40.	-34	0	381	DISTILLA	381.	0	0.29	0.35	0.24
34 GTRA12 GT-SCPE-12 HEAT	0	142.	290.	91.	104.	30.	0	102	290	DISTILLA	392.	0	0.27	0.27	0.23
35 GTRA16 GT-SCPE-16 POWR	0.	142.	391.	131.	136.	40.	-47	0	391	DISTILLA	391.	0	0.27	0.35	0.23
35 GTRA16 GT-SCPE-16 HEAT	0.	132.	272.	91.	95.	28.	0	130	272	DISTILLA	402.	0	0.25	0.24	0.23
36 GTR208 GT-SCPE-08 POWR	0.	107.	427.	163.	136.	40.	-84	0	427	DISTILLA	427.	0	0.20	0.32	0.21
36 GTR208 GT-SCPE-08 HEAT	0.	107.	239.	91.	76.	22.	0	188.	239	DISTILLA	427.	0	0.20	0.18	0.21
37 GTR212 GT-SCPE-12 POWR	0.	120.	414.	151.	136.	40.	-71.	0.	414	DISTILLA	414.	0	0.22	0.33	0.22
37 GTR212 GT-SCPE-12 HEAT	0.	115.	248.	91.	82.	24.	0.	170.	248	DISTILLA	418.	0	0.22	0.20	0.22
38 GTR216 GT-SCPE-16 POWR	0.	129.	405.	147.	136.	40.	-66	0.	405	DISTILLA	405.	0	0.24	0.34	0.22
38 GTR216 GT-SCPE-16 HEAT	0.	120.	250.	91.	84.	25.	0.	163.	250	DISTILLA	413.	0	0.23	0.20	0.22
39 GTRW08 GT-SCPE-08 POWR	0.	145.	389.	97.	136.	40.	-7.	0.	389	DISTILLA	389.	0	0.27	0.35	0.23
39 GTRW08 GT-SCPE-08 HEAT	0.	143.	366.	91.	129.	38.	0.	25.	366	DISTILLA	391.	0	0.27	0.33	0.23
40 GTRW12 GT-SCPE-12 POWR	0.	159.	375.	97.	136.	40.	-8.	0.	375	DISTILLA	375.	0	0.30	0.36	0.24
40 GTRW12 GT-SCPE-12 HEAT	0.	155.	350.	91.	127.	37.	0.	28.	350	DISTILLA	378.	0	0.29	0.34	0.24

I25E PFO ADV DESIGN ENGR

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33??1 N? 40.00 PROCESS MILLIONS BTU/HR 91.0 PROCESS TEMP(F) 448. PRODUCT MINI-STEEL HOURS PER YEAR 6700

POWER TO HEAT RATIO 1.500

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-6?RE-16 POWR	0.	151.	382.	108.	136.	40.	-20.	0.	382.	DISTILLA	382.	0	0.28	0.36	0.24
41 GTRW16 GT-6?RE-16 HEAT	0.	144.	323.	91.	115.	34.	0.	66.	323.	DISTILLA	389.	0	0.27	0.30	0.23
42 GTR308 GT-6ORE-08 POWR	0.	93.	440.	129.	136.	40.	-44.	0.	440.	DISTILLA	440.	C	0.17	0.31	0.21
42 GTR308 GT-6ORE-08 HEAT	0.	97.	311.	91.	96.	28.	0.	125.	311.	DISTILLA	436.	0	0.18	0.22	0.21
43 GTR312 GT-6ORE-12 POWR	0.	134.	399.	128.	136.	40.	-44.	0.	399.	DISTILLA	399.	0	0.25	0.34	0.23
43 GTR312 GT-6ORE-12 HEAT	0.	127.	284.	91.	97.	28.	0.	123.	284.	DISTILLA	407.	0	0.24	0.24	0.22
44 GTR316 GT-6ORE-16 POWR	0.	131.	403.	130.	136.	40.	-46.	0.	403.	DISTILLA	403.	0	0.25	0.34	0.23
44 GTR316 GT-6ORE-16 HEAT	0.	124.	281.	91.	95.	[illegible]	0.	128.	281.	DISTILLA	410.	0	0.23	0.23	0.22
45 FCPADS FUEL-CL-PH POWR	0.	139.	359.	61.	136.	40.	35.	0.	394.	DISTILLA	394.	0	0.26	0.35	0.23
45 FCPADS FUEL-CL-PH HEAT	0.	207.	535.	91.	203.	60.	0.	-209.	535.	DISTILLA	326.	0	0.28	0.38	0.17
46 FCMODS FUEL-CL-MO POWR	0.	186.	331.	77.	136.	40.	16.	0.	348.	DISTILLA	348.	0	0.35	0.39	0.26
46 FCMODS FUEL-CL-MO HEAT	0.	213.	391.	91.	161.	47.	0.	-76.	391.	DISTILLA	314.	0	0.36	0.41	0.23

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33311 MW 24.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	0	0.	0.32	0.
1	STM141	STM-TURB-1	POWR	0.	11.	253.	131.	85.	25.	-154.	0.	253.	RESIDUAL	253.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	11.	253.	131.	85.	25.	-154.	0.	253.	COAL-FGD	253.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL-FGD	264.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	11.	253.	131.	85.	25.	-154.	0.	253.	COAL-AFB	253.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	[illegible]	0.	0.	0.	264.	0.	COAL-AFB	264.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-15.	279.	153.	85.	25.	-180.	0.	279.	RESIDUAL	279.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-15.	279.	153.	85.	25.	-180.	0.	279.	COAL-FGD	279.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL-FGD	264.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-15.	279.	153.	85.	25.	-180.	0.	279.	COAL-AFB	279.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL-AFB	264.	111	0.	0.	0.
3	PFBSTM	PFB-STMTB-	POWR	0.	44.	221.	104.	85.	25.	-123.	0.	221.	COAL-PFB	221.	1	0.17	0.38	0.
3	PFBSTM	PFB-STMTB-	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL-PFB	264.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	60.	204.	87.	85.	25.	-103.	0.	204.	RESIDUAL	204.	1	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	60.	204.	87.	85.	25.	-103.	0.	204.	COAL	204.	1	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL	264.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-337.	601.	425.	85.	25.	-500.	0.	601.	RESIDUAL	601.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-337.	601.	425.	85.	25.	-500.	0.	601.	COAL	601.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL	264.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-11.	275.	115.	85.	25.	-135.	0.	275.	DISTILLA	275.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33311 MW 24.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-11.	275.	115.	85.	25.	-135.	0.	275.	RESIDUAL	275.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-11.	275.	115.	85.	25.	-135.	0.	275.	COAL	275.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL	264.	111	0.	0.	0.
7 HEGT85 HELIUM-GT- POWR	0.	1.	264.	118.	85.	25.	-139.	0.	264.	COAL-AFB	264.	11	0.00	0.32	0.
7 HEGT85 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL-AFB	264.	111	0.	0.	0.
8 HEGT60 HELIUM-GT- POWR	0.	-62.	327.	140.	85.	25.	-165.	0.	327.	COAL-AFB	327.	11	-0.24	0.26	0.
8 HEGT60 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL-AFB	264.	111	0.	0.	0.
9 HEGT00 HELIUM-GT- POWR	0.	-216.	481.	291.	85.	25.	-342.	0.	481.	COAL-AFB	481.	11	-0.82	0.18	0.
9 HEGT00 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL-AFB	264.	111	0.	0.	0.
10 FCMCCL FUEL-CL-MO POWR	0.	-14.	278.	133.	85.	25.	-157.	0.	278.	COAL	278.	11	-0.05	0.30	0.
10 FCMCCL FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL	264.	111	0.	0.	0.
11 FCSTCL FUEL-CL-ST POWR	0.	92.	172.	49.	85.	25.	-58.	0.	172.	COAL	172.	11	0.35	0.49	0.
11 FCSTCL FUEL-CL-ST HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL	264.	111	0.	0.	0.
12 IGGTST INT-GAS-GT POWR	0.	53.	212.	66.	85.	25.	-77.	0.	212.	COAL	212.	11	0.20	0.40	0.
12 IGGTST INT-GAS-GT HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	COAL	264.	111	0.	0.	0.
13 GTSOAR GT-HRSG-10 POWR	0.	-27.	292.	144.	85.	25.	-170.	0.	292.	RESIDUAL	292.	1	-0.10	0.29	0.
13 GTSOAR GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
14 GTAC08 GT-HRSG-08 POWR	0.	-49.	313.	151.	85.	25.	-177.	0.	313.	RESIDUAL	313.	1	-0.19	0.27	0.
14 GTAC08 GT-HRSG-08 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
15 GTAC12 GT-HRSG-12 POWR	0.	-13.	277.	143.	85.	25.	-168.	0.	277.	RESIDUAL	277.	1	-0.05	0.31	0.
15 GTAC12 GT-HRSG-12 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
16 GTAC16 GT-HRSG-16 POWR	0.	2.	262.	132.	85.	25.	-155.	0.	262.	RESIDUAL	262.	1	0.01	0.32	0.
16 GTAC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
17 GTWC16 GT-HRSG-16 POWR	0.	-4.	269.	107.	85.	25.	-126.	0.	269.	RESIDUAL	269.	1	-0.02	0.32	0.
17 GTWC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33311 MW 24.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	81.	183.	41.	85.	25.	-49.	0.	183.	RESIDUAL	183.	1	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	81.	183.	46.	85.	25.	-54.	0.	183.	RESIDUAL	183.	11	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
20 CC1222 GTST-12/22 POWR	0.	83.	181.	45.	85.	25.	-53.	0.	181.	RESIDUAL	181.	1	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	81.	183.	54.	85.	25.	-64.	0.	183.	RESIDUAL	183.	1	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
22 STIG15 STIG-15-16 POWR	0.	42.	222.	3.	85.	25.	-3.	0.	222.	RESIDUAL	222.	1	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
23 STIG10 STIG-10-16 POWR	0.	29.	236.	31.	85.	25.	-37.	0.	236.	RESIDUAL	236.	1	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
24 STIG1S STIG-1S-16 POWR	0.	12.	252.	53.	85.	25.	-63.	0.	252.	RESIDUAL	252.	1	0.05	0.34	0.
24 STIG1S STIG-1S-16 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	36.	228.	82.	85.	25.	-97.	0.	228.	RESIDUAL	228.	1	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
26 DEADV2 DIESEL-ADV POWR	0.	36.	228.	58.	85.	25.	-68.	0.	228.	RESIDUAL	228.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
27 DEADV1 DIESEL-ADV POWR	0.	36.	228.	89.	85.	25.	-105.	0.	228	RESIDUAL	228.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
28 DEHTPM ADV-DIESEL POWR	0.	54.	211.	107.	85.	25.	-126.	0.	211.	RESIDUAL	211.	1	0.20	0.40	0.
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	30.	234.	76.	85.	25.	-90.	0.	234.	DISTILLA	234.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	30.	234.	76.	85.	25.	-90.	0.	234.	RESIDUAL	234.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33311 MW 24.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL . WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	30.	234.	52.	85.	25.	-61.	0.	234.	DISTILLA	234.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
30 DESOA2 DIESEL-SOA POWR	0.	30.	234.	52.	85.	25.	-61.	0.	234.	RESIDUAL	234.	1	0 11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0	0.
31 DESOA1 DIESEL-SOA POWR	0.	30.	234.	94.	85.	25.	-111.	0.	234.	DISTILLA	234.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	30.	234.	94.	85.	25.	-111.	0.	234.	RESIDUAL	234.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	RESIDUAL	264.	111	0.	0.	0.
32 GTSOAD GT-HRSG-10 POWR	0.	-25.	290.	156.	85.	25.	-184.	0.	290.	DISTILLA	290.	1	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
33 GTRA08 GT-85RE-08 POWR	0.	27.	237.	96.	85.	25.	-113.	0.	237.	DISTILLA	237.	1	0.10	0.36	0.
33 GTRA08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
34 GTRA12 GT-85RE-12 POWR	0.	28.	236.	97.	85.	25.	-114.	0.	236.	DISTILLA	236.	1	0.11	0.36	0.
34 GTRA12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
35 GTRA16 GT-85RE-16 POWR	0.	22.	242.	103.	85.	25.	-121.	0.	242.	DISTILLA	242.	1	0.08	0.35	0.
35 GTRA16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	264.	125.	85.	25.	-147.	0.	264.	DISTILLA	264.	1	0.	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
37 GTR212 GT-60RE-12 POWR	0.	8.	256.	115.	85.	25.	-135.	0.	256.	DISTILLA	256.	1	0.03	0.33	0.
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
38 GTR216 GT-60RE-16 POWR	0.	13.	251.	112.	85.	25.	-132.	0.	251.	DISTILLA	251.	1	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
39 GTRW08 GT-85RE-08 POWR	0.	23.	241.	80.	85.	25.	-94.	0.	241.	DISTILLA	241.	1	0.09	0.35	0.
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
40 GTRW12 GT-85RE-12 POWR	0.	32.	232.	77.	85.	25.	-91.	0.	232.	DISTILLA	232.	1	0.[illegible]	0.36	0.
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.

HONEYWELL PAGE PRINTING SYSTEM- P1185-02

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33311 MW 24.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	27.	237.	83.	85.	25.	-98.	0.	237.	DISTILLA	237.	1	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	C.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
42 GTR308 GT-60RE-08 POWR	0.	-9.	273.	122.	85.	25.	-144.	0.	273.	DISTILLA	273.	1	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	17.	247.	94.	85.	25.	-111.	0.	247.	DISTILLA	247.	1	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	15.	250.	96.	85.	25.	-113.	0.	250.	DISTILLA	250.	1	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	42.	223.	38.	85.	25.	-45.	0.	223.	DISTILLA	223.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	59.	205.	48.	85.	25.	-56.	0.	205.	DISTILLA	205.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	264.	0.	DISTILLA	264.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33312 MW 25.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	0.	275.	0.	DISTILLA	275.	0	0.	0.32	0.
1 STM141 STM-TURB-1 POWR	0.	12.	263.	136.	88.	26.	-160.	0.	263.	RESIDUAL	263.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	12.	263.	136.	88.	26.	-160.	0.	263.	COAL-FGD	263.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL-FGD	275.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	12.	263.	136.	88.	26.	-160.	0.	263.	COAL-AFB	263.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL-AFB	275.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-15.	290.	159.	88.	26.	-187.	0.	290.	RESIDUAL	290.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	C.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-15.	290.	159.	88.	26.	-187.	0.	290.	COAL-FGD	290.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL-FGD	275.	111	0.	0	0.
2 STM088 STM-TURB-8 POWR	0.	-15.	290.	159.	88.	26.	-187.	0.	290.	COAL-AFB	290.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL-AFB	275.	111	0.	0.	0.
3 PFBSTM PFB-STMTB- POWR	0.	45.	230.	109.	88.	26.	-128.	0.	230.	COAL-PFB	230.	1	0.17	0.38	0.
3 PFBSTM PFB-STMTB- HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL-PFB	275.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	63.	212.	91.	88.	26.	-107.	0.	212.	RESIDUAL	212.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	63.	212.	91.	88.	26.	-107.	0.	212.	COAL	212.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL	275.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-351.	626.	442.	88.	26.	-520.	0.	626.	RESIDUAL	626.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-351.	626.	442.	88.	26.	-520.	0.	626.	COAL	626.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL	275.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-11.	286.	119.	88.	26.	-140.	0.	286.	DISTILLA	286.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	DISTILLA	275.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33312 MW 25.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	-11.	286.	119.	88.	26.	-140.	0.	286.	RESIDUAL	286.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-11.	286.	119.	88.	26.	-140.	0.	286.	COAL	286.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL	275.	111	0.	0.	0.
7	HEGT85	HELIUM-GT-	POWR	0.	1.	274.	123.	88.	26.	-144.	0.	274.	COAL-AFB	274.	11	0.00	0.32	0
7	HEGT85	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL-AFB	275.	111	0.	0.	0.
8	HEGT60	HELIUM-GT-	POWR	0.	-65.	340.	146.	88.	26.	-172.	0.	340.	COAL-AFB	340.	11	-0.24	0.26	0.
8	HEGT60	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL-AFB	275.	111	0.	0.	0.
9	HEGT00	HELIUM-GT-	POWR	0.	-225.	500.	302.	88.	26.	-356.	0.	500.	COAL-AFB	500.	11	-0.82	0.18	0.
9	HEGT00	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL-AFB	275.	111	0.	0.	0.
10	FCMCCL	FUEL-CL-MO	POWR	0.	-14.	290.	139.	88.	26.	-163.	0.	290.	COAL	290.	11	-0.05	0.30	0.
10	FCMCCL	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL	275.	111	0.	0.	0.
11	FCSTCL	FUEL-CL-ST	POWR	0.	96.	179.	51.	88.	26.	-61.	0.	179.	COAL	179.	11	0.35	0.49	0.
11	FCSTCL	FUEL-CL-ST	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL	275.	111	0.	0.	0.
12	IGGTST	INT-GAS-GT	POWR	0.	55.	220.	68.	88.	26.	-80.	0.	220.	COAL	220.	11	0.20	0.40	0.
12	IGGTST	INT-GAS-GT	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	COAL	275.	111	0.	0.	0.
13	GTSOAR	GT-HRSG-10	POWR	0.	-28.	304.	150.	88.	26.	-176.	0.	304.	RESIDUAL	304.	1	-0.10	0.29	0.
13	GTSOAR	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
14	GTAC08	GT-HRSG-08	POWR	0.	-51.	326.	157.	88.	26.	-184.	0.	326.	RESIDUAL	326.	1	-0.19	0.27	0.
14	GTAC08	GT-HRSG-08	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0	0.	0.
15	GTAC12	GT-HRSG-12	POWR	0.	-14.	289.	149.	88.	26.	-175.	0.	28[illegible]	RESIDUAL	289.	1	-0.05	0.31	0.
15	GTAC12	GT-HRSG-12	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
16	GTAC16	GT-HRSG-16	POWR	0.	3.	273.	137.	88.	26.	-161.	0.	273.	RESIDUAL	273.	1	0.01	0.32	0.
16	GTAC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0
17	GTWC16	GT-HRSG-16	POWR	0.	-4.	279.	112.	88.	25.	-131.	0.	279.	RESIDUAL	279.	1	-0.02	0.32	0.
17	GTWC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33312 MW 25.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	84.	191.	43.	88.	26.	-51.	0.	191.	RESIDUAL	191.	1	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	85.	191.	48.	88.	26.	-56.	0.	191.	RESIDUAL	191.	11	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
20 CC1222 GTST-12/22 POWR	0.	86	189.	47.	88.	26.	-55.	0.	189.	RESIDUAL	189.	1	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	84.	191.	56.	88.	26.	-66.	0.	191.	RESIDUAL	191.	1	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
22 STIG15 STIG-15-16 POWR	0.	44.	231.	3.	88.	26.	-4.	0.	231.	RESIDUAL	231.	1	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
23 STIG10 STIG-10-16 POWR	0.	30.	245.	32.	88.	26.	-38.	0.	245.	RESIDUAL	245.	1	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
24 STIG1S STIG-1S-16 POWR	0.	12.	263.	55.	88.	26.	-65.	0.	263.	RESIDUAL	263.	1	0.05	0.34	0.
24 STIG1S STIG-1S-16 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	38.	237.	85.	88.	26.	-100.	0.	237.	RESIDUAL	237.	1	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
26 DEADV2 DIESEL-ADV POWR	0.	38.	237.	60.	88.	26.	-71.	0.	237.	RESIDUAL	237.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
27 DEADV1 DIESEL-ADV POWR	0.	38.	237.	93.	88.	26.	-109.	0.	237.	RESIDUAL	237.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
28 DEHTPM ADV-DIESEL POWR	0.	56.	219.	112.	88.	26.	-131.	0.	219.	RESIDUAL	219.	1	0.20	0.40	0.
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	31.	244.	79.	88.	26.	-93.	0.	244.	DISTILLA	244.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	DISTILLA	275.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	31.	244.	79.	88.	26.	-93.	0.	244.	RESIDUAL	244.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	RESIDUAL	275.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33312 MW 25.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0 PRODUCT COPPER-SMELT HOURS PER YEAR 8400

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	31.	244	54.	88.	26.	-63.	0	244	DISTILLA	244.	1	0.11	0.36	0.
30	DESOA2	DIESEL-SOA	HEAT	0.	0.	0	0.	0.	0.	0.	275	0	DISTILLA	275.	111	0	0.	0.
30	DESOA2	DIESEL-SOA	POWR	0.	31.	244	54.	88.	26.	-63.	0	244	RESIDUAL	244.	1	0.11	0.36	0.
30	DESOA2	DIESEL-SOA	HEAT	0.	0.	0	0.	0.	0.	0.	275	0	RESIDUAL	275.	111	0	0.	0.
31	DESOA1	DIESEL-SOA	POWR	0.	31	244	98	88	26	-115.	0	244	DISTILLA	244.	1	0.11	0.36	0
31	DESOA1	DIESEL-SOA	HEAT	0.	0	0	0	0.	0.	0	275	0	DISTILLA	275.	111	0	0.	0
31	DESOA1	DIESEL-SOA	POWR	0.	31	244	98.	88.	26.	-115.	0	244	RESIDUAL	244	1	0.11	0.36	0.
31	DESOA1	DIESEL-SOA	HEAT	0.	0	0	0	0	0.	0.	275	0	RESIDUAL	275.	111	0	0.	0.
32	GTSOAD	GT-HRSG-10	POWR	0	-26	301.	162.	88.	26	-191.	0.	301	DISTILLA	301.	1	-0.10	0.29	0.
32	GTSOAD	GT-HRSG-10	HEAT	0.	0.	0.	0.	0	0.	0	275.	0	DISTILLA	275.	111	0	0	0.
33	GTRA08	GT-85RE-08	POWR	0.	29.	247.	100.	88.	26	-117.	0	247	DISTILLA	247.	1	0.10	0.36	0.
33	GTRA08	GT-85RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0	DISTILLA	275.	111	0	0.	0
34	GTRA12	GT-85RE-12	POWR	0.	29.	246	101.	88.	26.	-119.	0.	246	DISTILLA	246.	1	0.11	0.36	0.
34	GTRA12	GT-85RE-12	HEAT	0.	0	0	0.	0	0.	0.	275	0	DISTILLA	275.	111	0	0.	0
35	GTRA16	GT-85RE-16	POWR	0.	23	252	107.	88	26.	-126.	0.	252	DISTILLA	252.	1	0.08	0.35	0.
35	GTRA16	GT-85RE-16	HEAT	0.	0	0.	0.	0	0.	0	275	0	DISTILLA	275.	111	0	0	0.
36	GTR208	GT-60RE-08	POWR	0.	0.	275.	130.	88.	26.	-153.	0.	275	DISTILLA	275.	1	0.	0.32	0
36	GTR208	GT-60RE-08	HEAT	0.	0	0.	0.	0.	0.	0.	275	0	DISTILLA	275.	111	0	0.	0
37	GTR212	GT-60RE-12	POWR	0.	8.	267.	119.	88.	26.	-140	0.	267	DISTILLA	267.	1	0.03	0.33	0
37	GTR212	GT-60RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0	DISTILLA	275.	111	0.	0.	0
38	GTR216	GT-60RE-16	POWR	0.	14	261.	117.	88.	26.	-137.	0.	261	DISTILLA	261.	1	0.05	0.34	0.
38	GTR216	GT-60RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	275	0	DISTILLA	275.	111	0	0.	0.
39	GTRW08	GT-85RE-08	POWR	0.	24.	251.	83.	88.	26.	-97.	0.	251	DISTILLA	251	1	0.09	0.35	0
39	GTRW08	GT-85RE-08	HEAT	0.	0	0.	0.	0.	0	0.	275.	0	DISTILLA	275.	111	0.	0	0
40	GTRW12	GT-85RE-12	POWR	0.	33.	242.	81.	88.	26.	-95.	0.	242	DISTILLA	242	1	0.12	0.36	0
40	GTRW12	GT-85RE-12	HEAT	0.	0.	0.	0.	0.	0.	0	275.	0	DISTILLA	275.	111	0.	0.	0

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

18SE PEG ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33312 MW 25.80 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	29.	247.	86	88.	26.	-102	0	247	DISTILLA	247.	1	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0	0.	0.	0.	275	0.	DISTILLA	275.	111	0.	0.	0.
42 GTR308 GT-60RE-08 POWR	0.	-9.	284	127.	88.	26.	-150.	0	284	DISTILLA	284.	1	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	275	0.	DISTILLA	275.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	18.	257.	98.	88.	26.	-116.	0.	257	DISTILLA	257.	1	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	DISTILLA	275.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	15.	260.	100.	88.	26.	-117.	0.	260	DISTILLA	260.	1	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	DISTILLA	275.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	43.	232.	39.	88.	26.	-46.	0.	232	DISTILLA	232.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	DISTILLA	275.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MC POWR	0.	61.	214.	50.	88.	26.	-59	0.	214	DISTILLA	214.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MC HEAT	0.	0.	0.	0.	0.	0.	0.	275.	0.	DISTILLA	275.	111	0.	0.	0.

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33313 MW 28.50 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	0	0.	0.32	0.
1 STM141 STM-TURB-1 POWR	0.	13.	291.	150.	97.	29.	-177.	0.	291.	RESIDUAL	291.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	13.	291.	150.	97.	29.	-177.	0.	291.	COAL-FGD	291.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL-FGD	304.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	13.	291.	150.	97.	29.	-177.	0.	291.	COAL-AFB	291.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL-AFB	304.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-17.	321.	175.	97.	29.	-206.	0.	321.	RESIDUAL	321.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-17.	321.	175.	97.	29.	-206.	0.	321.	COAL-FGD	321.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL-FGD	304.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-17.	321.	175.	97.	29.	-206.	0.	321.	COAL-AFB	321.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL-AFB	304.	111	0.	0.	0.
3 PFBSTM PFB-STMTB- POWR	0.	50.	254.	120.	97.	29.	-141.	0.	254.	COAL-PFB	254.	1	0.17	0.38	0.
3 PFBSTM PFB-STMTB- HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL-PFB	304.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	70.	234.	100.	97.	29.	-118.	0.	234.	RESIDUAL	234.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	70.	234.	100.	97.	29.	-118.	0.	234.	COAL	234.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL	304.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-387.	691.	489.	97.	29.	-575.	0.	691.	RESIDUAL	691.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-387.	691.	489.	97.	29.	-575.	0.	691.	COAL	691.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL	304.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-12.	316.	132.	97.	29.	-155.	0.	316.	DISTILLA	316.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33313 MW 28.50 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-12.	316.	132.	97.	29.	-155.	0.	316.	RESIDUAL	316.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-12.	316.	132.	97.	29.	-155.	0.	316.	COAL	316.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL	304.	111	0.	0.	0.
7 HEGT85 HELIUM-GT- POWR	0.	1.	303.	135.	97.	29.	-159.	0.	303.	COAL-AFB	303.	11	0.00	0.32	0.
7 HEGT85 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL-AFB	304.	111	0.	0.	0.
8 HEGT60 HELIUM-GT- POWR	0.	-72.	375.	161.	97.	29.	-190.	0.	375.	COAL-AFB	375.	11	-0.24	0.26	0.
8 HEGT60 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL-AFB	304.	111	0.	0.	0.
9 HEGT00 HELIUM-GT- POWR	0.	-249.	553.	334.	97.	29.	-393.	0.	553.	COAL-AFB	553.	11	-0.82	0.18	0.
9 HEGT00 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL-AFB	304.	111	0.	0.	0.
10 FCMOCL FUEL-CL-MO POWR	0.	-16.	320.	153.	97.	29.	-180.	0.	320.	COAL	320.	11	-0.05	0.30	0.
10 FCMOCL FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL	304.	111	0.	0.	0.
11 FCSTCL FUEL-CL-ST POWR	0.	106.	198.	57.	97.	29.	-67.	0.	198.	COAL	198.	11	0.35	0.49	0.
11 FCSTCL FUEL-CL-ST HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL	304.	111	0.	0.	0.
12 IGGTST INT-GAS-GT POWR	0.	61.	243.	75.	97.	29.	-89.	0.	243.	COAL	243.	11	0.20	0.40	0.
12 IGGTST INT-GAS-GT HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	COAL	304.	111	0.	0.	0.
13 GTSOAR GT-HRSG-10 POWR	0.	-31.	335.	166.	97.	29.	-195.	0.	335.	RESIDUAL	335.	1	-0.10	0.29	0.
13 GTSOAR GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
14 GTAC08 GT-HRSG-08 POWR	0.	-56.	360.	173.	97.	29.	-204.	0.	360.	RESIDUAL	360.	1	-0.19	0.27	0.
14 GTAC08 GT-HRSG-08 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
15 GTAC12 GT-HRSG-12 POWR	0.	-15.	319.	165.	97.	29.	-194.	0.	319.	RESIDUAL	319.	1	-0.05	0.31	0.
15 GTAC12 GT-HRSG-12 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
16 GTAC16 GT-HRSG-16 POWR	0.	3.	301.	151.	97.	29.	-178.	0.	301.	RESIDUAL	301.	1	0.01	0.32	0.
16 GTAC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
17 GTWC16 GT-HRSG-16 POWR	0.	-5.	309.	123.	97.	29.	-145.	0.	309.	RESIDUAL	309.	1	-0.02	0.32	0.
17 GTWC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.

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FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33313 MW 28.50 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILER 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	93.	211.	48.	97.	29.	-56.	0.	211.	RESIDUAL	211.	1	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	93.	211.	53.	97.	29.	-62.	0.	211.	RESIDUAL	211.	1	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
20 CC1222 GTST-12/22 POWR	0.	95.	208.	52.	97.	29.	-61.	0.	208.	RESIDUAL	208.	1	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	93.	211.	62.	97.	29.	-73.	0.	211.	RESIDUAL	211.	1	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
22 STIG15 STIG-15-16 POWR	0.	49.	255.	3.	97.	29.	-4.	0.	255.	RESIDUAL	255.	1	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
23 STIG10 STIG-10-16 POWR	0.	33.	271.	36.	97.	29.	-42.	0.	271.	RESIDUAL	271.	1	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
24 STIG1S STIG-1S-16 POWR	0.	14.	290.	61.	97.	29.	-72.	0.	290.	RESIDUAL	290.	1	0.05	0.34	0.
24 STIG1S STIG-1S-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	42.	262.	94.	97.	29.	-111.	0.	262.	RESIDUAL	262.	1	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
26 DEADV2 DIESEL-ADV POWR	0.	42.	262.	67.	97.	29.	-78.	0.	262.	RESIDUAL	262.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
27 DEADV1 DIESEL-ADV POWR	0.	42.	262.	102.	97.	29.	-121.	0.	262.	RESIDUAL	262.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
28 DEHTPM ADV-DIESEL POWR	0.	62.	242.	123.	97.	29.	-145.	0.	242.	RESIDUAL	242.	1	0.20	0.40	0.
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	35.	269.	88.	97.	29.	-103.	0.	269.	DISTILLA	269.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	35.	269.	88.	97.	29.	-103.	0.	269.	RESIDUAL	269.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	RESIDUAL	304.	111	0.	0.	0.

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY
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FUEL ENERGY SAVED BY PROCESS AND ECS

I&SE PRO ADV DESIGN ENGR

INDUSTRY 33313 NW 26.50 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT COPPER-SMELT HOURS PER YEAR 8400.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL   WASTE FUEL EQV BTU*10**6= 0.   HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DES0A2 DIESEL-SOA POWR	0.	35.	269.	59.	97.	29.	-70.	0.	269	DISTILLA	269.	1	0.11	0.36	0.
30 DES0A2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
30 DES0A2 DIESEL-SOA POWR	0.	35.	269.	59.	97.	29.	-70.	0.	269	RESIDUAL	269.	1	0.11	0.36	0.
30 DES0A2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	RESIDUAL	304.	111	0.	0.	0.
31 DES0A1 DIESEL-SOA POWR	0.	35.	269.	108.	97.	29.	-127.	0.	269	DISTILLA	269.	1	0.11	0.36	0.
31 DES0A1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
31 DES0A1 DIESEL-SOA POWR	0.	35.	269.	108.	97.	29.	-127.	0.	269	RESIDUAL	269.	1	0.11	0.36	0.
31 DES0A1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	RESIDUAL	304.	111	0.	0.	0.
32 GTS0AD GT-HRSG-10 POWR	0.	-29.	333.	179.	97.	29.	-211.	0.	333	DISTILLA	333.	1	-0.10	0.29	0.
32 GTS0AD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
33 GTRA08 GT-65RE-08 POWR	0.	31.	272.	110.	97.	29.	-129.	0.	272	DISTILLA	272.	1	0.10	0.36	0.
33 GTRA08 GT-65RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
34 GTRA12 GT-65RE-12 POWR	0.	32.	272.	111.	97.	29.	-131.	0.	272	DISTILLA	272.	1	0.11	0.36	0.
34 GTRA12 GT-65RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
35 GTRA16 GT-65RE-16 POWR	0.	25.	279.	118.	97.	29.	-139.	0.	279	DISTILLA	279.	1	0.08	0.35	0.
35 GTRA16 GT-65RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
36 GTR208 GT-60RE-08 POWR	0.	0.	304.	143.	97.	29.	-169.	0.	304	DISTILLA	304.	1	0.	0.32	0.
36 GTR208 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
37 GTR212 GT-60RE-12 POWR	0.	9.	295.	132.	97.	29.	-155.	0.	295	DISTILLA	295.	1	0.03	0.33	0.
37 GTR212 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
38 GTR216 GT-60RE-16 POWR	0.	15.	289.	129.	97.	29.	-152.	0.	289	DISTILLA	289.	1	0.05	0.34	0.
38 GTR216 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
39 GTRW08 GT-65RE-08 POWR	0.	27.	277.	91.	97.	29.	-108.	0.	277	DISTILLA	277.	1	0.09	0.35	0.
39 GTRW08 GT-65RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.
40 GTRW12 GT-65RE-12 POWR	0.	37.	267.	89.	97.	29.	-105.	0.	267	DISTILLA	267.	1	0.12	0.36	0.
40 GTRW12 GT-65RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0	DISTILLA	304.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	31.	272.	95.	97.	29.	-112.	0.	272.	DISTILLA	272.	1	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	111	0.	0.	0.
42 GTR308 GT-60RE-08 POWR	0.	-10.	314.	141.	97.	29.	-166.	0.	314.	DISTILLA	314.	1	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	20.	284.	109.	97.	29.	-128.	0.	284.	DISTILLA	284.	1	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	17.	287.	110.	97.	29.	-130.	0.	287.	DISTILLA	287.	1	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	111	0.	0.	0.
45 FCMADS FUEL-OL-PH POWR	0.	48.	256.	44.	97.	29.	-51.	0.	256.	DISTILLA	256.	1	0.16	0.38	0.
45 FCMADS FUEL-OL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	111	0.	0.	0.
46 FCMCDS FUEL-OL-HO POWR	0.	68.	236.	55.	97.	29.	-65.	0.	236.	DISTILLA	236.	1	0.22	0.41	0.
46 FCMCDS FUEL-OL-HO HEAT	0.	0.	0.	0.	0.	0.	0.	304.	0.	DISTILLA	304.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33314 MW 10.10 PROCESS MILLIONS BTU/HR 40.0 PROCESS TEMP(F) 364. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.862

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	47.	108.	47.	COAL-AFB	155.	0	0.	0.22	0.26
1 STM141 STM-TURB-1 POWR	0.	-107.	262.	188.	34.	10.	-174.	0.	262.	RESIDUAL	262.	0	-0.69	0.13	0.15
1 STM141 STM-TURB-1 HEAT	0.	14.	56.	40.	7.	2.	0.	85.	56.	RESIDUAL	140.	10	0.09	0.05	0.28
1 STM141 STM-TURB-1 POWR	0.	-107.	262.	188.	34.	10.	-174.	0.	262.	COAL-FGD	262.	0	-0.69	0.13	0.15
1 STM141 STM-TURB-1 HEAT	0.	14.	56.	40.	7.	2.	0.	85.	56.	COAL-FGD	140.	10	0.09	0.05	0.28
1 STM141 STM-TURB-1 POWR	0.	-107.	262.	188.	34.	10.	-174.	0.	262.	COAL-AFB	262.	0	-0.69	0.13	0.15
1 STM141 STM-TURB-1 HEAT	0.	14.	56.	40.	7.	2.	0.	85.	56.	COAL-AFB	140.	10	0.09	0.05	0.28
2 STM088 STM-TURB-8 POWR	0.	-202.	356.	268.	34.	10.	-269.	0.	356.	RESIDUAL	356.	0	-1.30	0.10	0.11
2 STM088 STM-TURB-8 HEAT	0.	10.	53.	40.	5.	2.	0.	92.	53.	RESIDUAL	145.	10	0.06	0.04	0.28
2 STM088 STM-TURB-8 POWR	0.	-202.	356.	268.	34.	10.	-269.	0.	356.	COAL-FGD	356.	0	-1.30	0.10	0.11
2 STM088 STM-TURB-8 HEAT	0.	10.	53.	40.	5.	2.	0.	92.	53.	COAL-FGD	145.	10	0.06	0.04	0.28
2 STM088 STM-TURB-8 POWR	0.	-202.	356.	268.	34.	10.	-269.	0.	356.	COAL-AFB	356.	0	-1.30	0.10	0.11
2 STM088 STM-TURB-8 HEAT	0.	10.	53.	40.	5.	2.	0.	92.	53.	COAL-AFB	145.	10	0.06	0.04	0.28
3 PFBSTM PFB-STMTB- POWR	0.	-18.	173.	111.	34.	10.	-84.	0.	173.	COAL-PFB	173.	10	-0.12	0.20	0.23
3 PFBSTM PFB-STMTB- HEAT	0.	24.	62.	40.	12.	4.	0.	69.	62.	COAL-PFB	131.	10	0.15	0.09	0.30
4 TISTMT TI-STMTB-1 POWR	0.	16.	138.	82.	34.	10.	-50.	0.	138.	RESIDUAL	138.	10	0.11	0.25	0.29
4 TISTMT TI-STMTB-1 HEAT	0.	32.	67.	40.	17.	5.	0.	55.	67.	RESIDUAL	123.	10	0.21	0.14	0.33
4 TISTMT TI-STMTB-1 POWR	0.	16.	138.	82.	34.	10.	-50.	0.	138.	COAL	138.	10	0.11	0.25	0.29
4 TISTMT TI-STMTB-1 HEAT	0.	32.	67.	40.	17.	5.	0.	55.	67.	COAL	123.	10	0.21	0.14	0.33
5 TIHRSG THERMIONIC POWR	0.	-90.	245.	158.	34.	10.	-139.	0.	245.	RESIDUAL	245.	0	-0.58	0.14	0.16
5 TIHRSG THERMIONIC HEAT	0.	12.	62.	40.	9.	3.	0.	80.	62.	RESIDUAL	142.	10	0.08	0.06	0.28
5 TIHRSG THERMIONIC POWR	0.	-90.	245.	158.	34.	10.	-139.	0.	245.	COAL	245.	0	-0.58	0.14	0.16
5 TIHRSG THERMIONIC HEAT	0.	12.	62.	40.	9.	3.	0.	80.	62.	COAL	142.	10	0.08	0.06	0.28
6 STIRL STIRLING-1 POWR	0.	18.	137.	65.	34.	10.	-29.	0.	137.	DISTILLA	137.	0	0.12	0.25	0.29
6 STIRL STIRLING-1 HEAT	0.	29.	84.	40.	21.	6.	0.	41.	84.	DISTILLA	125.	0	0.19	0.17	0.32

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

185E PLO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33314 MW 10.10 PROCESS MILLIONS BTU/HR 40.0 PROCESS TEMP(F) 364. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.862

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	18.	137.	65.	34.	10.	-29	0.	137.	RESIDUAL	137.	0	0.12	0.25	0.29
6	STIRL	STIRLING-1	HEAT	0.	29.	84.	40.	21.	6.	0	41.	84.	RESIDUAL	125.	0	0.19	0.17	0.32
6	STIRL	STIRLING-1	POWR	0.	18.	137.	65.	34.	10.	-29.	0.	137.	COAL	137.	0	0.12	0.25	0.29
6	STIRL	STIRLING-1	HEAT	0.	29.	84.	40.	21.	6.	0.	41.	84.	COAL	125.	0	0.19	0.17	0.32
7	HEGT85	HELIUM-GT-	POWR	0.	16.	107.	13.	34.	10.	32.	0.	139.	COAL-AFB	139.	10	0.10	0.25	0.29
7	HEGT85	HELIUM-GT-	HEAT	0.	48.	330.	40.	106.	31.	0.	-223.	330.	COAL-AFB	107.	10	0.13	0.32	0.12
8	HEGT60	HELIUM-GT-	POWR	0.	20.	133.	39.	34.	10.	1.	0.	134.	COAL-AFB	134.	10	0.13	0.26	0.30
8	HEGT60	HELIUM-GT-	HEAT	0.	21.	137.	40.	35.	10.	0.	-3.	137.	COAL-AFB	134.	10	0.13	0.26	0.29
9	HEGT00	HELIUM-GT-	POWR	0.	-41.	196.	96.	34.	10.	-66.	0.	196.	COAL-AFB	196.	10	-0.27	0.18	0.20
9	HEGT60	HELIUM-GT-	HEAT	0.	10.	82.	40.	14.	4.	0.	63.	82.	COAL-AFB	145.	10	0.07	0.10	0.28
10	FCMCCL	FUEL-CL-MO	POWR	0.	41.	113.	54.	34.	10.	-16.	0.	113.	COAL	113.	10	0.27	0.30	0.35
10	FCMCCL	FUEL-CL-MO	HEAT	0.	43.	84.	40.	26.	8.	0	27.	84.	COAL	112.	10	0.28	0.23	0.36
11	FCSTCL	FUEL-CL-ST	POWR	0.	60.	91.	37.	34.	10	4.	0.	95.	COAL	95.	10	0.38	0.36	0.42
11	FCSTCL	FUEL-CL-ST	HEAT	0.	65.	100.	40.	38.	11	0.	-10.	100.	COAL	90.	10	0.39	0.38	0.40
12	IGGTST	INT-GAS-GT	POWR	0.	31.	124.	53.	34.	10.	-16.	0.	124.	COAL	124.	10	0.20	0.26	0.32
12	IGGTST	INT-GAS-GT	HEAT	0.	35.	93.	40.	26.	8.	0.	27.	93.	COAL	120.	10	0.23	0.22	0.33
13	GTSOAR	GT-HRSG-10	POWR	0.	36.	119.	50.	34.	10.	-12.	0.	119.	RESIDUAL	119.	0	0.23	0.29	0.34
13	GTSOAR	GT-HRSG-10	HEAT	0.	38.	94.	40.	27.	8.	0.	22.	94.	RESIDUAL	117.	10	0.25	0.23	0.34
14	GTAC08	GT-HRSG-08	POWR	0.	27.	128.	66.	34.	10.	-30.	0.	128.	RESIDUAL	128.	10	0.18	0.27	0.31
14	GTAC08	GT-HRSG-08	HEAT	0.	35.	78.	40.	21.	6.	0.	42.	78.	RESIDUAL	120.	10	0.23	0.18	0.33
15	GTAC12	GT-HRSG-12	POWR	0.	42.	113.	52.	34.	10.	-15.	0.	113.	RESIDUAL	113.	10	0.27	0.31	0.35
15	GTAC12	GT-HRSG-12	HEAT	0.	43.	86.	40.	26.	8.	0.	26.	86.	RESIDUAL	112.	10	0.28	0.24	0.36
16	GTAC16	GT-HRSG-16	POWR	0.	48.	107.	46.	34.	10.	-7.	0.	107.	RESIDUAL	107.	10	0.31	0.32	0.37
16	GTAC16	GT-HRSG-16	HEAT	0.	48.	92.	40.	30.	9.	0.	14.	92.	RESIDUAL	107.	10	0.31	0.28	0.37
17	GTWC16	GT-HRSG-16	POWR	0.	45.	109.	44.	34.	10.	-5.	0.	109.	RESIDUAL	109.	10	0.29	0.32	0.37
17	GTWC16	GT-HRSG-16	HEAT	0.	46.	99.	40.	31.	9.	0.	10.	99.	RESIDUAL	109.	10	0.29	0.29	0.37

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33314 MW 10.10 PROCESS MILLIONS BTU/HR 40.0 PROCESS TEMP(F) 364. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.862

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	49.	92.	29.	34.	10.	13.	0.	105.	RESIDUAL	105.	10	0.32	0.33	0.38
16 CC1626 GTST-16/26 HEAT	0.	68.	127.	40.	47.	14.	0.	-40.	127.	RESIDUAL	87.	10	0.35	0.37	0.31
19 CC1622 GTST-16/22 POWR	0.	52.	94.	32.	34.	10.	9.	0.	103.	RESIDUAL	103.	10	0.34	0.34	0.39
19 CC1622 GTST-16/22 HEAT	0.	64.	116.	40.	43.	12.	0.	-25.	116.	RESIDUAL	91.	10	0.36	0.37	0.34
20 CC1222 GTST-12/22 POWR	0.	52.	94.	33.	34.	10.	9.	0.	102.	RESIDUAL	102.	10	0.34	0.34	0.39
20 CC1222 GTST-12/22 HEAT	0.	64.	115.	40.	42.	12.	0.	-25.	115.	RESIDUAL	90.	10	0.36	0.37	0.35
21 CC0822 GTST-08/22 POWR	0.	55.	100.	41.	34.	10.	-1.	0.	100.	RESIDUAL	100.	10	0.36	0.35	0.40
21 CC0822 GTST-08/22 HEAT	0.	55.	97.	40.	34.	10.	0.	3.	97.	RESIDUAL	100.	10	0.35	0.34	0.40
22 STIG15 STIG-15-16 POWR	0.	19.	90.	1.	34.	10.	46.	0.	136.	RESIDUAL	136.	10	0.12	0.25	0.29
22 STIG15 STIG-15-16 HEAT	0.	634.	3077.	40.	1172.	344.	0.	-3556.	3077.	RESIDUAL	-479.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	27.	96.	13.	34.	10.	32.	0.	128.	RESIDUAL	128.	10	0.17	0.27	0.31
23 STIG10 STIG-10-16 HEAT	0.	84.	302.	40.	108.	32.	0.	-231.	302.	RESIDUAL	71.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	30.	103.	22.	34.	10.	22.	0.	124.	RESIDUAL	124.	10	0.20	0.28	0.32
24 STIG1S STIG-1S-16 HEAT	0.	56.	190.	40.	64.	19.	0.	-91.	190.	RESIDUAL	99.	10	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	37.	93.	19.	34.	10.	25.	0.	117.	RESIDUAL	117.	0	0.24	0.29	0.34
25 DEADV3 DIESEL-ADV HEAT	0.	78.	194.	40.	72.	21.	0.	-118.	194.	RESIDUAL	77.	0	0.29	0.37	0.21
26 DEADV2 DIESEL-ADV POWR	0.	43.	93.	24.	34.	10.	19.	0.	112.	RESIDUAL	112.	1	0.28	0.31	0.36
26 DEADV2 DIESEL-ADV HEAT	0.	72.	157.	40.	58.	17.	0.	-75.	157.	RESIDUAL	83.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	58.	93.	36.	34.	10.	4.	0.	97.	RESIDUAL	97.	1	0.37	0.35	0.41
27 DEADV1 DIESEL-ADV HEAT	0.	63.	102.	40.	38.	11.	0.	-11.	102.	RESIDUAL	91.	1	0.38	0.37	0.39
28 DEHTPM ADV-DIESEL POWR	0.	50.	105.	45.	34.	10.	-6.	0.	105.	RESIDUAL	105.	0	0.32	0.33	0.38
28 DEHTPM ADV-DIESEL HEAT	0.	49.	93.	40.	31.	9.	0.	12.	93.	RESIDUAL	105.	0	0.32	0.29	0.38
29 DESOAS DIESEL-SOA POWR	0.	32.	95.	16.	34.	10.	28.	0.	123.	DISTILLA	123.	0	0.20	0.28	0.32
29 DESOAS DIESEL-SOA HEAT	0.	77.	233.	40.	84.	25.	0.	-155.	233.	DISTILLA	78.	0	0.25	0.36	0.17
29 DESOAS DIESEL-SOA POWR	0.	32.	95.	16.	34.	10.	28.	0.	123.	RESIDUAL	123.	0	0.20	0.28	0.32
29 DESOAS DIESEL-SOA HEAT	0.	77.	233.	40.	84.	25.	0.	-155.	233.	RESIDUAL	78.	0	0.25	0.36	0.17

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PRD ADV DE TCH ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33314 MW 10.10 PROCESS MILLIONS BTU/HR 40.0 PROCESS TEMP(F) 364. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.862

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

			WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROC. HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2	DIESEL-SOA	POWR	0.	37.	95.	21.	34.	10.	22.	0.	118.	DISTILLA	118.	1	0.24	0.29	0.34
30 DESOA2	DIESEL-SOA	HEAT	0.	70.	182.	40.	66.	19.	0.	-97.	182.	DISTILLA	84.	1	0.28	0.36	0.22
30 DESOA2	DIESEL-SOA	POWR	0.	37.	95.	21.	34.	10.	22.	0.	118.	RESIDUAL	118.	1	0.24	0.29	0.34
30 DESOA2	DIESEL-SOA	HEAT	0.	70.	182.	40.	66.	19.	0.	-97.	182.	RESIDUAL	84.	1	0.28	0.36	0.22
31 DESOA1	DIESEL-SOA	POWR	0.	57.	95.	38.	34.	10.	2.	0.	97.	DISTILLA	97.	1	0.37	0.35	0.41
31 DESOA1	DIESEL-SOA	HEAT	0.	60.	100.	40.	36.	11.	0.	-5.	100.	DISTILLA	95.	1	0.37	0.36	0.40
31 DESOA1	DIESEL-SOA	POWR	0.	57.	95.	38.	34.	10.	2.	0.	97.	RESIDUAL	97.	1	0.37	0.35	0.41
31 DESOA1	DIESEL-SOA	HEAT	0.	60.	100.	40.	36.	11.	0.	-5.	100.	RESIDUAL	95.	1	0.37	0.36	0.40
32 GTSOAD	GT-HRSG-10	POWR	0.	37.	118.	54.	34.	10.	-17.	0.	118.	DISTILLA	118.	10	0.24	0.29	0.34
32 GTSOAD	GT-HRSG-10	HEAT	0.	39.	87.	40.	25.	7.	0.	28.	87.	DISTILLA	115.	10	0.26	0.22	0.35
33 GTRA08	GT-35RE-08	POWR	0.	49.	97.	33.	34.	10.	9.	0.	105.	DISTILLA	105.	10	0.32	0.33	0.38
33 GTRA08	GT-35RE-08	HEAT	0.	61.	119.	40.	42.	12.	0.	-25.	119.	DISTILLA	94.	10	0.34	0.36	0.34
34 GTRA12	GT-35RE-12	POWR	0.	51.	96.	33.	34.	10.	8.	0.	104.	DISTILLA	104.	10	0.33	0.33	0.38
34 GTRA12	GT-35RE-12	HEAT	0.	61.	115.	40.	41.	12.	0.	-21.	115.	DISTILLA	94.	10	0.35	0.36	0.35
35 GTRA16	GT-35RE-16	POWR	0.	51.	99.	36.	34.	10.	5.	0.	104.	DISTILLA	104.	10	0.33	0.33	0.39
35 GTRA16	GT-35RE-16	HEAT	0.	57.	110.	40.	38.	11.	0.	-12.	110.	DISTILLA	98.	10	0.34	0.35	0.36
36 GTR208	GT-60RE-08	POWR	0.	47.	108.	43.	34.	10.	-4.	0.	108.	DISTILLA	108.	10	0.30	0.32	0.37
36 GTR208	GT-60RE-08	HEAT	0.	47.	99.	40.	32.	9.	0.	8.	99.	DISTILLA	108.	10	0.30	0.30	0.37
37 GTR212	GT-60RE-12	POWR	0.	50.	104.	40.	34.	10.	-0.	0.	104.	DISTILLA	104.	10	0.33	0.33	0.38
37 GTR212	GT-60RE-12	HEAT	0.	50.	103.	40.	34.	10.	0.	1.	103.	DISTILLA	104.	10	0.32	0.33	0.38
38 GTR216	GT-60RE-16	POWR	0.	52.	102.	39.	34.	10.	1.	0.	103.	DISTILLA	103.	10	0.33	0.33	0.39
38 GTR216	GT-60RE-16	HEAT	0.	53.	104.	40.	35.	10.	0.	-2.	104.	DISTILLA	102.	10	0.34	0.34	0.39
39 GTRW08	GT-35RE-08	POWR	0.	42.	98.	27.	34.	10.	15.	0.	113.	DISTILLA	113.	10	0.27	0.30	0.35
39 GTRW08	GT-35RE-08	HEAT	0.	61.	144.	40.	51.	15.	0.	-50.	144.	DISTILLA	94.	10	0.30	0.35	0.28
40 GTRW12	GT-35RE-12	POWR	0.	45.	95.	27.	34.	10.	15.	0.	110.	DISTILLA	110.	10	0.29	0.31	0.36
40 GTRW12	GT-35RE-12	HEAT	0.	66.	141.	40.	51.	15.	0.	-53.	141.	DISTILLA	88.	10	0.32	0.36	0.28

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33314 MW 10.10 PROCESS MILLIONS BTU/HR 40.0 PROCESS TEMP(F) 364. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.862

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-GORE-16 POWR	0.	45.	97.	29.	34.	10.	13.	0.	109.	DISTILLA	109.	10	0.29	0.31	0.37
41 GTRW16 GT-GORE-16 HEAT	0.	62.	133.	40.	47.	14.	0.	-41.	133.	DISTILLA	92.	10	0.32	0.36	0.30
42 GTR308 GT-GORE-08 POWR	0.	39.	111.	36.	34.	10.	5.	0.	116.	DISTILLA	116.	10	0.25	0.30	0.34
42 GTR308 GT-GORE-08 HEAT	0.	43.	124.	40.	39.	11.	0.	-13.	124.	DISTILLA	112.	10	0.26	0.31	0.32
43 GTR312 GT-GORE-12 POWR	0.	46.	101.	33.	34.	10.	8.	0.	109.	DISTILLA	109.	10	0.30	0.32	0.37
43 GTR312 GT-GORE-12 HEAT	0.	55.	121.	40.	41.	12.	0.	-21.	121.	DISTILLA	99.	10	0.31	0.34	0.33
44 GTR316 GT-GORE-16 POWR	0.	46.	102.	34.	34.	10.	7.	0.	109.	DISTILLA	109.	10	0.30	0.32	0.37
44 GTR316 GT-GORE-16 HEAT	0.	54.	120.	40.	41.	12.	0.	-19.	120.	DISTILLA	101.	10	0.31	0.34	0.33
45 FCPADS FUEL-CL-PH POWR	0.	35.	91.	15.	34.	10.	29.	0.	120.	DISTILLA	120.	0	0.23	0.29	0.33
45 FCPADS FUEL-CL-PH HEAT	0.	91.	235.	40.	89.	26.	0.	-172.	235.	DISTILLA	64.	0	0.28	0.38	0.17
46 FCHCDS FUEL-CL-MO POWR	0.	47.	84.	19.	34.	10.	24.	0.	108.	DISTILLA	108.	0	0.30	0.32	0.37
46 FCHCDS FUEL-CL-MO HEAT	0.	96.	172.	40.	71.	21.	0.	-113.	172.	DISTILLA	58.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33315 MW 18.50 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366. PRODUCT COPPER-SMELT HOURS PER YEAR 7620

POWER TO HEAT RATIO 1.052

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL* UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C G O N	0.	0.	0.	0.	0.	0.	71.	197.	71.	COAL-AFB	268.	0	0.	0.24	0.22
1 STM141 STM-TURB-1 POWR	0.	-216.	484.	348.	63.	19.	-339.	0.	484.	RESIDUAL	484.	0	-0.81	0.13	0.12
1 STM141 STM-TURB-1 HEAT	0.	21.	83.	60.	11.	3.	0.	163.	83.	RESIDUAL	247.	10	0.08	0.04	0.24
1 STM141 STM-TURB-1 POWR	0.	-216.	484.	348.	63.	19.	-339.	0.	484.	COAL-FGD	484.	0	-0.81	0.13	0.12
1 STM141 STM-TURB-1 HEAT	0.	21.	83.	60.	11.	3.	0.	163.	83.	COAL-FGD	247.	10	0.08	0.04	0.24
1 STM141 STM-TURB-1 POWR	0.	-216.	484.	348.	63.	19.	-339.	0.	484.	COAL-AFB	484.	0	-0.81	0.13	0.12
1 STM141 STM-TURB-1 HEAT	0.	21.	83.	60.	11.	3.	0.	163.	83.	COAL-AFB	247.	10	0.08	0.04	0.24
2 STM088 STM-TURB-8 POWR	0.	-393.	661.	499.	63.	19.	-516.	0.	661.	RESIDUAL	661.	0	-1.47	0.10	0.09
2 STM088 STM-TURB-8 HEAT	0.	15.	80.	60.	8.	2.	0.	174.	80.	RESIDUAL	253.	10	0.06	0.03	0.24
2 STM088 STM-TURB-8 POWR	0.	-393.	661.	499.	63.	19.	-516.	0.	661.	COAL-FGD	661.	0	-1.47	0.10	0.09
2 STM088 STM-TURB-8 HEAT	0.	15.	80.	60.	8.	2.	0.	174.	80.	COAL-FGD	253.	10	0.06	0.03	0.24
2 STM088 STM-TURB-8 POWR	0.	-393.	661.	499.	63.	19.	-516.	0.	661.	COAL-AFB	661.	0	-1.47	0.10	0.09
2 STM088 STM-TURB-8 HEAT	0.	15.	80.	60.	8.	2.	0.	174.	80.	COAL-AFB	253.	10	0.06	0.03	0.24
3 PFBSTM PFB-STMTB- POWR	0.	-50.	318.	205.	63.	19.	-170.	0.	318.	COAL-PFB	318.	0	-0.19	0.20	0.19
3 PFBSTM PFB-STMTB- HEAT	0.	35.	93.	60.	19.	5.	0.	139.	93	COAL-PFB	233.	10	0.13	0.08	0.26
4 TISTMT TI-STMTB-1 POWR	0.	14.	254.	151.	63.	19.	-107.	0.	254.	RESIDUAL	254.	0	0.05	0.25	0.24
4 TISTMT TI-STMTB-1 HEAT	0.	48.	101.	60.	25.	7.	0.	119.	101.	RESIDUAL	220.	10	0.18	0.11	0.27
4 TISTMT TI-STMTB-1 POWR	0.	14.	254.	151	63.	19.	-107.	0.	254.	COAL	254.	0	0.05	0.25	0.24
4 TISTMT TI-STMTB-1 HEAT	0.	48.	101.	60.	25.	7.	0.	119.	101.	COAL	220.	10	0.18	0.11	0.27
5 TIHRSG THERMIONIC POWR	0.	-181.	449.	290.	63.	19.	-270.	0.	449.	RESIDUAL	449.	0	-0.67	0.14	0.13
5 TIHRSG THERMIONIC HEAT	0.	19.	93.	60.	13.	4.	0.	156.	93.	RESIDUAL	249.	0	0.07	0.05	0.24
5 TIHRSG THERMIONIC POWR	0.	-181.	449.	290.	63.	19.	-270.	0.	449.	COAL	449.	0	-0.67	0.14	0.13
5 TIHRSG THERMIONIC HEAT	0.	19.	93.	60.	13.	4.	0.	156.	93.	COAL	249.	0	0.07	0.05	0.24
6 STIRL STIRLING-1 POWR	0.	17.	251.	120.	63.	19.	-70.	0.	251.	DISTILLA	251.	0	0.06	0.25	0.24
6 STIRL STIRLING-1 HEAT	0.	44.	126.	60.	32.	9.	0.	98.	126.	DISTILLA	224.	0	0.16	0.14	0.27

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33315 MW 18.50 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 1.052

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	17.	251.	120.	63.	19.	-70.	0.	251.	RESIDUAL	251.	0	0.06	0.25	0.24
6	STIRL	STIRLING-1	HEAT	0.	44.	126.	60.	32.	9.	0.	98.	126.	RESIDUAL	224.	0	0.16	0.14	0.27
6	STIRL	STIRLING-1	POWR	0.	17.	251.	120.	63.	19.	-70.	0.	251.	COAL	2[illegible].	0	0.06	0.25	0.24
6	STIRL	STIRLING-1	HEAT	0.	44.	126.	60.	32.	9.	0.	98.	126.	COAL	224.	0	0.16	0.14	0.27
7	HEGT85	HELIUM-GT-	POWR	0.	28.	197.	23.	63.	19.	43.	0.	240.	COAL-AFB	240.	10	0.10	0.26	0.25
7	HEGT85	HELIUM-GT-	HEAT	0.	72.	507.	60.	163.	48.	0.	-312.	507.	COAL-AFB	196.	10	0.12	0.32	0.12
8	HEGT60	HELIUM-GT-	POWR	0.	24.	244.	71.	63.	19.	-13.	0.	244.	COAL-AFB	244.	10	0.09	0.26	0.25
8	HEGT60	HELIUM-GT-	HEAT	0.	31.	206.	60.	53.	16.	0.	30.	206.	COAL-AFB	237.	10	0.12	0.23	0.25
9	HEGT00	HELIUM-GT-	POWR	0.	-91.	359.	175.	63.	19.	-135.	0.	359.	COAL-AFB	359.	10	-0.34	0.18	0.17
9	HEGT00	HELIUM-GT-	HEAT	0.	15.	123.	60.	22.	6.	0.	130.	123.	COAL-AFB	253.	10	0.06	0.09	0.24
10	FCMCCL	FUEL-CL-MO	POWR	0.	60.	208.	98.	63.	19.	-45.	0.	208.	COAL	208.	10	0.22	0.30	0.29
10	FCMCCL	FUEL-CL-MO	HEAT	0.	64.	127.	60.	39.	11.	0.	77.	127.	COAL	204.	10	0.24	0.19	0.29
11	FCSTCL	FUEL-CL-ST	POWR	0.	100.	168.	67.	63.	19.	-9.	0.	168.	COAL	168.	10	0.37	0.38	0.36
11	FCSTCL	FUEL-CL-ST	HEAT	0.	97.	149.	60.	56.	16.	0.	22.	149.	COAL	171.	10	0.36	0.33	0.35
12	IGGTST	INT-GAS-GT	POWR	0.	41.	227.	98.	63.	19.	-45.	0.	227.	COAL	227.	10	0.15	0.28	0.26
12	IGGTST	INT-GAS-GT	HEAT	0.	52.	139.	60.	39.	11.	0.	77.	139.	COAL	216.	10	0.20	0.18	0.28
13	GTSOAR	GT-HRSG-10	POWR	0.	50.	218.	92.	63.	19.	-38.	0.	218.	RESIDUAL	218.	0	0.19	0.29	0.28
13	GTSOAR	GT-HRSG-10	HEAT	0.	57.	141.	60.	41.	12.	0.	69.	141.	RESIDUAL	211.	0	0.21	0.19	0.29
14	GTAC08	GT-HRSG-08	POWR	0.	34.	234.	120.	63.	19.	-71.	0.	234.	RESIDUAL	234.	0	0.13	0.27	0.26
14	GTAC08	GT-HRSG-08	HEAT	0.	52.	117.	60.	31.	9.	0.	99.	117.	RESIDUAL	215.	10	0.20	0.15	0.28
15	GTAC12	GT-HRSG-12	POWR	0.	61.	207.	96.	63.	19.	-42.	0.	207.	RESIDUAL	207.	0	0.23	0.31	0.29
15	GTAC12	GT-HRSG-12	HEAT	0.	65.	129.	60.	39.	12.	0.	74.	129.	RESIDUAL	203.	10	0.24	0.19	0.30
16	GTAC16	GT-HRSG-16	POWR	0.	72.	195.	85.	63.	19.	-29.	0.	195.	RESIDUAL	195.	0	0.27	0.32	0.31
16	GTAC16	GT-HRSG-16	HEAT	0.	72.	139.	60.	45.	13.	0.	57.	139.	RESIDUAL	196.	10	0.27	0.23	0.31
17	GTWC16	GT-HRSG-16	POWR	0.	67.	200.	81.	63.	19.	-25.	0.	200.	RESIDUAL	200.	10	0.25	0.32	0.30
17	GTWC16	GT-HRSG-16	HEAT	0.	68.	148.	60.	47.	14.	0.	51.	148.	RESIDUAL	200.	10	0.25	0.23	0.30

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I8SE PED ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33315 MW 18.50 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366 PRODUCT COPPER-SMELT HOURS PER YEAR 7620

POWER TO HEAT RATIO 1.052

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	91.	169.	53.	63.	19.	8.	0.	177.	RESIDUAL	177.	10	0.34	0.36	0.34
18 CC1626 GTST-16/26 HEAT	0.	102.	190.	60.	71.	21.	0.	-24.	190.	RESIDUAL	166.	0	0.35	0.37	0.32
19 CC1622 GTST-16/22 POWR	0.	95.	172.	59.	63.	19.	1.	0.	173.	RESIDUAL	173.	10	0.36	0.37	0.35
19 CC1622 GTST-16/22 HEAT	0.	96.	174.	60.	64.	19.	0.	-2.	174.	RESIDUAL	172.	10	0.36	0.37	0.35
20 CC1222 GTST-12/22 POWR	0.	98.	172.	60.	63.	19.	0.	0.	172.	RESIDUAL	172.	0	0.36	0.37	0.35
20 CC1222 GTST-12/22 HEAT	0.	56.	172.	60.	63.	19.	0.	-1.	172.	RESIDUAL	171.	0	0.36	0.37	0.35
21 CC0822 GTST-08/22 POWR	0.	85.	183.	76.	63.	19.	-18.	0.	183.	RESIDUAL	183.	0	0.32	0.34	0.33
21 CC0822 GTST-08/22 HEAT	0.	82.	146.	60.	50.	15.	0.	41.	146.	RESIDUAL	186.	0	0.31	0.27	0.32
22 STIG15 STIG-15-16 POWR	0.	34.	166.	2.	63.	19.	68.	0.	234.	RESIDUAL	234.	10	0.13	0.27	0.26
22 STIG15 STIG-15-16 HEAT	0.	950.	4615	60.	1758.	515.	0	-5298.	4615.	RESIDUAL	-683.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	49.	176.	23.	63.	19.	43.	0.	219.	RESIDUAL	219.	10	0.18	0.29	0.27
23 STIG10 STIG-10-16 HEAT	0.	126.	453.	60.	163.	48.	0.	-311.	453.	RESIDUAL	142.	0	0.22	0.36	0.13
24 STIG15 STIG-15-16 POWR	0.	56.	188.	40	63.	19.	24.	0.	212.	RESIDUAL	212.	10	0.21	0.30	0.28
24 STIG15 STIG-15-16 HEAT	0.	84.	285.	60.	95.	28.	0.	-101.	285.	RESIDUAL	184.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	68.	170.	35	63.	19.	30.	0	200.	RESIDUAL	200.	0	0.25	0.32	0.30
25 DEADV3 DIESEL-ADV HEAT	0.	117.	293.	60.	109.	32.	0.	-142.	293.	RESIDUAL	151.	0	0.29	0.37	0.20
26 DEADV2 DIESEL-ADV POWR	0.	78.	170.	43.	63.	19.	20.	0.	190.	RESIDUAL	190.	1	0.29	0.33	0.32
26 DEADV2 DIESEL-ADV HEAT	0.	108.	236.	60.	88.	26.	0.	-77.	236.	RESIDUAL	160.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	98.	170.	67.	63.	19.	-8.	0.	170.	RESIDUAL	170.	1	0.36	0.37	0.35
27 DEADV1 DIESEL-ADV HEAT	0.	95.	153.	60.	57.	17.	0.	19.	153.	RESIDUAL	173.	1	0.35	0.33	0.35
28 DEHTPM ADV-DIESEL POWR	0.	75.	193.	83.	6[illegible]	19.	-27.	0.	[illegible]33.	RESIDUAL	193.	0	0.26	0.33	0.31
28 DEHTPM ADV-DIESEL HEAT	0.	74.	140.	60.	4[illegible]	13.	0.	54.	140.	RESIDUAL	194.	0	0.27	0.24	0.31
29 DESOA3 DIESEL-SOA POWR	0.	58.	175.	30.	63.	19.	35.	0.	210.	DISTILLA	210.	0	0.21	0.30	0.29
29 DESOA3 DIESEL-SOA HEAT	0.	116.	351.	60.	127.	37.	0.	-199.	351.	DISTILLA	152.	0	0.25	0.36	0.17
29 DESOA3 DIESEL-SOA POWR	0.	58.	175.	30	63.	19.	35.	0.	210.	RESIDUAL	210.	0	0.21	0.30	0.29
29 DESOA3 DIESEL-SOA HEAT	0.	116.	351.	60.	127.	37.	0.	-199.	351.	RESIDUAL	152.	0	0.25	0.36	0.17

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE REQ ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33315 NW 18.50 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 1.052

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	68.	175.	38.	63.	19.	25.	0.	200.	DISTILLA	200.	1	0.25	0.32	0.30
30	DESOA2	DIESEL-SOA	HEAT	0.	106.	273.	60.	98.	29.	0.	-110.	273.	DISTILLA	162.	1	0.28	0.36	0.22
30	DESOA2	DIESEL-SOA	POWR	0.	68.	175.	38.	63.	19.	25.	0.	200.	RESIDUAL	200.	1	0.25	0.32	0.30
30	DESOA2	DIESEL-SOA	HEAT	0.	106.	273.	60.	98.	29.	0.	-110.	273.	RESIDUAL	162.	1	0.28	0.36	0.22
31	DESOA1	DIESEL-SOA	POWR	0.	93.	175.	70.	63.	19.	-12.	0.	175.	DISTILLA	175.	1	0.35	0.36	0.34
31	DESOA1	DIESEL-SOA	HEAT	0.	90.	150.	60.	54.	16.	0.	28.	150.	DISTILLA	178.	1	0.34	0.30	0.34
31	DESOA1	DIESEL-SOA	POWR	0.	93.	175.	70.	63.	19.	-12.	0.	175.	RESIDUAL	175.	1	0.35	0.36	0.34
31	DESOA1	DIESEL-SOA	HEAT	0.	90.	150.	60.	54.	16.	0.	28.	150.	RESIDUAL	178.	1	0.34	0.30	0.34
32	GTSOAD	GT-HRSG-10	POWR	0.	52.	216.	100.	63.	19.	-47.	0.	216.	DISTILLA	216.	0	0.19	0.29	0.28
32	GTSOAD	GT-HRSG-10	HEAT	0.	59.	130.	60.	38.	11.	0.	78.	130.	DISTILLA	209.	10	0.22	0.18	0.29
33	GTR408	GT-SCRE-08	POWR	0.	90.	177.	59.	63.	19.	1.	0.	177.	DISTILLA	177.	0	0.34	0.36	0.34
33	GTR408	GT-SCRE-08	HEAT	0.	91.	178.	60.	64.	19.	0.	-2.	178.	DISTILLA	177.	0	0.34	0.36	0.34
34	GTR412	GT-SCRE-12	POWR	0.	92.	176.	61.	63.	19.	-1.	0.	176.	DISTILLA	176.	0	0.34	0.36	0.34
34	GTR412	GT-SCRE-12	HEAT	0.	91.	173.	60.	62.	18.	0.	3.	173.	DISTILLA	17[illegible]	0	0.34	0.35	0.34
35	GTR416	GT-SCRE-16	POWR	0.	87.	181.	66.	63.	19.	-7.	0.	181.	DISTILLA	18	0	0.32	0.35	0.33
35	GTR416	GT-SCRE-16	HEAT	0.	86.	166.	60.	58.	17.	0.	17.	166.	DISTILLA	182.	0	0.32	0.32	0.33
36	GTR208	GT-SCRE-08	POWR	0.	71.	197.	79.	63.	19.	-23.	0.	197.	DISTILLA	197.	0	0.26	0.32	0.30
36	GTR208	GT-SCRE-08	HEAT	0.	71.	149.	60.	48.	14.	0.	48.	149.	DISTILLA	197.	0	0.26	0.24	0.30
37	GTR212	GT-SCRE-12	POWR	0.	77.	191.	74.	63.	19.	-16.	0.	191.	DISTILLA	191.	0	0.29	0.33	0.31
37	GTR212	GT-SCRE-12	HEAT	0.	75.	155.	60.	51.	15.	0.	37.	155.	DISTILLA	192.	0	0.28	0.27	0.31
38	GTR216	GT-SCRE-16	POWR	0.	81.	187.	72.	63.	19.	-14.	0.	187.	DISTILLA	187.	0	0.30	0.34	0.32
38	GTR216	GT-SCRE-16	HEAT	0.	79.	156.	60.	53.	15.	0.	33.	156.	DISTILLA	189.	0	0.29	0.28	0.32
39	GTRW08	GT-SCRE-08	POWR	0.	76.	180.	50.	63.	19.	12.	0.	192.	DISTILLA	192.	0	0.28	0.33	0.31
39	GTRW08	GT-SCRE-08	HEAT	0.	92.	216.	60.	76.	22.	0.	-40.	216.	DISTILLA	176.	0	0.30	0.35	0.28
40	GTRW12	GT-SCRE-12	POWR	0.	82.	173.	49.	63.	19.	13.	0.	186.	DISTILLA	186.	10	0.30	0.34	0.32
40	GTRW12	GT-SCRE-12	HEAT	0.	100.	212.	60.	77.	23.	0.	-43.	212.	DISTILLA	168.	0	0.32	0.36	0.28

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33315 MW 18.50 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 1.052

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	83.	177.	53.	63.	19.	8.	0.	185.	DISTILLA	185.	10	0.31	0.34	0.32
41 GTRW16 GT-85RE-16 HEAT	0.	94.	200.	60.	71.	21.	0.	-25.	200.	DISTILLA	174.	0	0.32	0.36	0.30
42 GTR308 GT-60RE-08 POWR	0.	64.	204.	65.	63.	19.	-6.	0.	204.	DISTILLA	204.	0	0.24	0.31	0.29
42 GTR308 GT-60RE-08 HEAT	0.	65.	187.	60.	58.	17.	0.	16	187.	DISTILLA	203.	10	0.24	0.29	0.30
43 GTR312 GT-60RE-12 POWR	0.	83.	185.	61.	63.	19.	-1.	0.	185.	DISTILLA	185.	10	0.31	0.34	0.33
43 GTR312 GT-60RE-12 HEAT	0.	83.	181.	60.	62.	18.	0.	4.	181.	DISTILLA	185.	10	0.31	0.33	0.32
44 GTR316 GT-60RE-16 POWR	0.	82.	186.	62.	63.	19.	-3.	0.	186.	DISTILLA	186.	10	0.30	0.34	0.32
44 GTR316 GT-60RE-16 HEAT	0.	81.	180.	60.	61.	18.	0.	7.	180.	DISTILLA	187.	10	0.30	0.33	0.32
45 FCPADS FUEL-CL-PH POWR	0.	64.	166.	28.	63.	19.	37.	0.	203.	DISTILLA	203.	0	0.24	0.31	0.29
45 FCPADS FUEL-CL-PH HEAT	0.	137.	353.	60.	134.	39.	0.	-222.	353.	DISTILLA	131.	0	0.28	0.38	0.17
46 FCMCDS FUEL-CL-MO POWR	0.	86.	153.	36.	63.	19.	29.	0.	182.	DISTILLA	182.	0	0.32	0.35	0.33
46 FCMCDS FUEL-CL-MO HEAT	0.	145.	258.	60.	106.	31.	0.	-134.	258.	DISTILLA	123.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33316 MW 16.00 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.910

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	71.	171.	71.	COAL-AFB	241.	0	0.	0.23	0.25
1 STM141 STM-TURB-1 POWR	0.	-177.	418.	301.	55.	16.	-284.	0.	418.	RESIDUAL	418.	0	-0.73	0.13	0.14
1 STM141 STM-TURB-1 HEAT	0.	21.	83.	60.	11.	3.	0.	137.	83.	RESIDUAL	220.	10	0.09	0.05	0.27
1 STM141 STM-TURB-1 POWR	0.	-177.	418.	301.	55.	16.	-284.	0.	418.	COAL-FGD	418.	0	-0.73	0.13	0.14
1 STM141 STM-TURB-1 HEAT	0.	21.	83.	60.	11.	3.	0.	137.	83.	COAL-FGD	220.	10	0.09	0.05	0.27
1 STM141 STM-TURB-1 POWR	0.	-177.	418.	301.	55.	16.	-284.	0.	418.	COAL-AFB	418.	0	-0.73	0.13	0.14
1 STM141 STM-TURB-1 HEAT	0.	21.	83.	60.	11.	3.	0.	137.	83.	COAL-AFB	220.	10	0.09	0.05	0.27
2 STM088 STM-TURB-8 POWR	0.	-330.	572.	431.	55.	16.	-437.	0.	572.	RESIDUAL	572.	0	-1.37	0.10	0.10
2 STM088 STM-TURB-8 HEAT	0.	15.	80.	60.	8.	2.	0.	147.	80.	RESIDUAL	226.	10	0.06	0.03	0.27
2 STM088 STM-TURB-8 POWR	0.	-330.	572.	431.	55.	16.	-437.	0.	572.	COAL-FGD	572.	0	-1.37	0.10	0.10
2 STM088 STM-TURB-8 HEAT	0.	15.	80.	60.	8.	2.	0.	147.	80.	COAL-FGD	226.	10	0.06	0.03	0.27
2 STM088 STM-TURB-8 POWR	0.	-330.	572.	431.	55.	16.	-437.	0.	572.	COAL-AFB	572.	0	-1.37	0.10	0.10
2 STM088 STM-TURB-8 HEAT	0.	15.	80.	60.	8.	2.	0.	147.	80.	COAL-AFB	226.	10	0.06	0.03	0.27
3 PFBSTM PFB-STMTB- POWR	0.	-34.	275.	177.	55.	16.	-138.	0.	275.	COAL-PFB	275.	0	-0.14	0.20	0.22
3 PFBSTM PFB-STMTB- HEAT	0.	35.	93.	60.	19.	5.	0.	113.	93.	COAL-PFB	206.	10	0.15	0.09	0.29
4 TISTMT TI-STMTB-1 POWR	0.	21.	220.	131.	55.	16.	-83.	0.	220.	RESIDUAL	220.	0	0.09	0.25	0.27
4 TISTMT TI-STMTB-1 HEAT	0.	48.	101.	60.	25.	7.	0.	92.	101.	RESIDUAL	193.	10	0.20	0.13	0.31
4 TISTMT TI-STMTB-1 POWR	0.	21.	220.	131.	55.	16.	-83.	0.	220.	COAL	220.	0	0.09	0.25	0.27
4 TISTMT TI-STMTB-1 HEAT	0.	48.	101.	60.	25.	7.	0.	92.	101.	COAL	193.	10	0.20	0.13	0.31
5 TIHRSG THERMIONIC POWR	0.	-147.	388.	251.	55.	16.	-224.	0.	388.	RESIDUAL	388.	0	-0.61	0.14	0.15
5 TIHRSG THERMIONIC HEAT	0.	19.	93.	60.	13.	4.	0.	130.	93.	RESIDUAL	223.	0	0.08	0.06	0.27
5 TIHRSG THERMIONIC POWR	0.	-147.	388.	251.	55.	16.	-224.	0.	388.	COAL	388.	0	-0.61	0.14	0.15
5 TIHRSG THERMIONIC HEAT	0.	19.	93.	60.	13.	4.	0.	130.	93.	COAL	223.	0	0.08	0.06	0.27
6 STIRL STIRLING-1 POWR	0.	25.	217.	103.	55.	16.	-51.	0.	217.	DISTILLA	217.	0	0.10	0.25	0.28
6 STIRL STIRLING-1 HEAT	0.	44.	126.	60.	32.	9.	0.	72.	126.	DISTILLA	197.	0	0.18	0.16	0.30

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33316 MW 16.00 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366 PRODUCT COPPER-SMELT HOURS PER YEAR 7620

POWER TO HEAT RATIO 0.910

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	25.	217.	103.	55.	16.	-51.	0.	217.	RESIDUAL	217.	0	0.10	0.25	0.28
6	STIRL	STIRLING-1	HEAT	0.	44.	126.	60.	32.	9.	0.	72.	126.	RESIDUAL	197.	0	0.18	0.16	0.30
6	STIRL	STIRLING-1	POWR	0.	25.	217.	103.	55.	16.	-51.	0.	217.	COAL	217.	0	0.10	0.25	0.28
6	STIRL	STIRLING-1	HEAT	0.	44.	126.	60.	32.	9.	0.	72.	126.	COAL	197.	0	0.18	0.16	0.30
7	HEGT85	HELIUM-GT-	POWR	0.	24.	170.	20.	55.	16.	47.	0.	217.	COAL-AFB	217.	10	0.10	0.25	0.28
7	HEGT85	HELIUM-GT-	HEAT	0.	72.	507.	60.	163.	48.	0.	-338.	507.	COAL-AFB	169.	10	0.12	0.32	0.12
8	HEGT60	HELIUM-GT-	POWR	0.	30.	211.	61.	55.	16.	-1.	0.	211.	COAL-AFB	211.	10	0.13	0.26	0.28
8	HEGT60	HELIUM-GT-	HEAT	0.	31.	206.	60.	53.	16.	0.	4.	206.	COAL-AFB	210.	10	0.13	0.25	0.29
9	HEGT00	HELIUM-GT-	POWR	0.	-69.	310.	151.	55.	16.	-108.	0.	310.	COAL-AFB	310.	10	-0.29	0.18	0.19
9	HEGT00	HELIUM-GT-	HEAT	0.	15.	123.	60.	22.	6.	0.	103.	123.	COAL-AFB	226.	10	0.06	0.10	0.27
10	FCMCCL	FUEL-CL-MO	POWR	0.	62.	180.	85.	55.	16.	-29.	0.	180.	COAL	180.	10	0.26	0.30	0.33
10	FCMCCL	FUEL-CL-MO	HEAT	0.	64.	127.	60.	39.	11.	0.	50.	127.	COAL	177.	10	0.27	0.22	0.34
11	FCSTCL	FUEL-CL-ST	POWR	0.	94.	145.	58.	55.	16.	2.	0.	147.	COAL	147.	10	0.39	0.37	0.41
11	FCSTCL	FUEL-CL-ST	HEAT	0.	97.	149.	60.	56.	16.	0.	-5.	149.	COAL	144.	10	0.39	0.38	0.40
12	IGGTST	INT-GAS-GT	POWR	0.	45.	196.	85.	55.	16.	-29.	0.	196.	COAL	196.	10	0.19	0.28	0.31
12	IGGTST	INT-GAS-GT	HEAT	0.	52.	139.	60.	39.	11.	0.	50.	139.	COAL	189.	10	0.22	0.20	0.32
13	GTSOAR	GT-HRSG-10	POWR	0.	53.	188.	80.	55.	16.	-23.	0.	188.	RESIDUAL	188.	0	0.22	0.29	0.32
13	GTSOAR	GT-HRSG-10	HEAT	0.	57.	141.	60.	41.	12.	0.	42.	141.	RESIDUAL	184.	0	0.24	0.22	0.33
14	GTAC08	GT-HRSG-08	POWR	0.	39.	202.	104.	55.	16.	-52.	0.	202.	RESIDUAL	202.	0	0.16	0.27	0.30
14	GTAC08	GT-HRSG-08	HEAT	0.	52.	117.	60.	31.	9.	0.	72.	117.	RESIDUAL	189.	10	0.22	0.17	0.32
15	GTAC12	GT-HRSG-12	POWR	0.	62.	179.	83.	55.	16.	-27.	0.	179.	RESIDUAL	179.	0	0.26	0.31	0.34
15	GTAC12	GT-HRSG-12	HEAT	0.	65.	129.	60.	39.	12.	0.	47.	129.	RESIDUAL	177.	10	0.27	0.22	0.34
16	GTAC16	GT-HRSG-16	POWR	0.	72.	169.	73.	55.	16.	-15.	0.	169.	RESIDUAL	169.	0	0.30	0.32	0.35
16	GTAC16	GT-HRSG-16	HEAT	0.	72.	139.	60.	45.	13.	0.	31.	139.	RESIDUAL	169.	10	0.30	0.26	0.35
17	GTWC16	GT-HRSG-16	POWR	0.	68.	173.	70.	55.	16.	-12.	0.	173.	RESIDUAL	173.	10	0.28	0.32	0.35
17	GTWC16	GT-HRSG-16	HEAT	0.	68.	148.	60.	47.	14.	0.	25.	148.	RESIDUAL	173.	10	0.28	0.27	0.35

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33316 MW 16.00 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.910

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	78.	147.	46.	55.	16.	16.	0.	163.	RESIDUAL	163.	10	0.32	0.34	0.37
18 CC1626 GTST-16/26 HEAT	0.	102.	190.	60.	71.	21.	0.	-51.	190.	RESIDUAL	139.	0	0.35	0.37	0.32
19 CC1622 GTST-16/22 POWR	0.	82.	149.	51.	55.	16.	10.	0.	159.	RESIDUAL	159.	10	0.34	0.34	0.38
19 CC1622 GTST-16/22 HEAT	0.	96.	174.	60.	64.	19.	0.	-29.	174.	RESIDUAL	145.	10	0.36	0.37	0.35
20 CC1222 GTST-12/22 POWR	0.	83.	148.	52.	55.	16.	10.	0.	158.	RESIDUAL	158.	0	0.34	0.35	0.38
20 CC1222 GTST-12/22 HEAT	0.	96.	172.	60.	63.	19.	0.	-27.	172.	RESIDUAL	145.	0	0.36	0.37	0.35
21 CC0822 GTST-08/22 POWR	0.	83.	158.	65.	55.	16.	-6.	0.	158.	RESIDUAL	158.	0	0.34	0.34	0.38
21 CC0822 GTST-08/22 HEAT	0.	82.	146.	60.	50.	15.	0.	14.	146.	RESIDUAL	159.	0	0.34	0.31	0.36
22 STIG15 STIG-15-16 POWR	0.	30.	143.	2.	55.	16.	68.	0.	212.	RESIDUAL	212.	10	0.12	0.26	0.28
22 STIG15 STIG-15-16 HEAT	0.	950.	4615.	60.	1758.	515.	0.	-5325.	4615.	RESIDUAL	-709.	0	0.17	0.38	0.01
23 STIG10 STIG-10-16 POWR	0.	42.	152.	20.	55.	16.	47.	0.	199.	RESIDUAL	199.	10	0.18	0.27	0.30
23 STIG10 STIG-10-16 HEAT	0.	126.	453.	60.	163.	48.	0.	-338.	453.	RESIDUAL	115.	0	0.22	0.36	0.13
24 STIG1S STIG-1S-16 POWR	0.	48.	163.	34.	55.	16.	30.	0.	193.	RESIDUAL	193.	10	0.20	0.28	0.31
24 STIG1S STIG-1S-16 HEAT	0.	84.	285.	60.	95.	28.	0.	-128.	285.	RESIDUAL	157.	0	0.23	0.34	0.21
25 DEADV3 DIESEL-ADV POWR	0.	59.	147.	30.	55.	16.	35.	0.	182.	RESIDUAL	182.	0	0.24	0.30	0.33
25 DEADV3 DIESEL-ADV HEAT	0.	117.	293.	60.	109.	32.	0.	-169.	293.	RESIDUAL	124.	0	0.29	0.37	0.20
26 DEADV2 DIESEL-ADV POWR	0.	67.	147.	37.	55.	16.	27.	0.	174.	RESIDUAL	174.	1	0.29	0.31	0.35
26 DEADV2 DIESEL-ADV HEAT	0.	108.	236.	60.	88.	26.	0.	-103.	236.	RESIDUAL	133.	1	0.31	0.37	0.25
27 DEADV1 DIESEL-ADV POWR	0.	91.	147.	58.	55.	16.	3.	0.	150.	RESIDUAL	150.	1	0.38	0.36	0.40
27 DEADV1 DIESEL-ADV HEAT	0.	95.	153.	60.	57.	17.	0.	-7.	153.	RESIDUAL	146.	1	0.38	0.37	0.39
28 DEHTPH ADV-DIESEL POWR	0.	74.	167.	72.	55.	16.	-14.	0.	167.	RESIDUAL	167.	0	0.31	0.33	0.36
28 DEHTPH ADV-DIESEL HEAT	0.	74.	140.	60.	46.	13.	0.	27.	140.	RESIDUAL	168.	0	0.31	0.27	0.36
29 DESOA3 DIESEL-SOA POWR	0.	50.	151.	26.	55.	16.	40.	0.	191.	DISTILLA	191.	0	0.21	0.29	0.31
29 DESOA3 DIESEL-SOA HEAT	0.	116.	351.	60.	127.	37.	0.	-225.	351.	DISTILLA	126.	0	0.25	0.36	0.17
29 DESOA3 DIESEL-SOA POWR	0.	50.	151.	26.	55.	16.	40.	0.	191.	RESIDUAL	191.	0	0.21	0.29	0.31
29 DESOA3 DIESEL-SOA HEAT	0.	116.	351.	60.	127.	37.	0.	-225.	351.	RESIDUAL	126.	0	0.25	0.36	0.17

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33316 MW 16.00 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.910

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	59.	151.	33.	55.	16.	31.	0.	183.	DISTILLA	183.	1	0.24	0.30	0.33
30 DESOA2 DIESEL-SOA HEAT	0.	106.	273.	60.	98.	29.	0.	-137.	273.	DISTILLA	136.	1	0.28	0.36	0.22
30 DESOA2 DIESEL-SOA POWR	0.	59.	151.	33.	55.	16.	31.	0.	183.	RESIDUAL	183.	1	0.24	0.30	0.33
30 DESOA2 DIESEL-SOA HEAT	0.	106.	273.	60.	98.	29.	0.	-137.	273.	RESIDUAL	136.	1	0.28	0.36	0.22
31 DESOA1 DIESEL-SOA POWR	0.	90.	151.	61.	55.	16.	-1.	0.	151.	DISTILLA	151.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA HEAT	0.	90.	150.	60.	54.	16.	0.	2.	150.	DISTILLA	151.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA POWR	0.	90.	151.	61.	55.	16.	-1.	0.	151.	RESIDUAL	151.	1	0.37	0.36	0.40
31 DESOA1 DIESEL-SOA HEAT	0.	90.	150.	60.	54.	16.	0.	2.	150.	RESIDUAL	151.	1	0.37	0.36	0.40
32 GTSOAD GT-HRSG-10 POWR	0.	54.	187.	86.	55.	16.	-31.	0.	187.	DISTILLA	187.	0	0.22	0.29	0.32
32 GTSOAD GT-HRSG-10 HEAT	0.	59.	130.	60.	38.	11.	0.	52.	130.	DISTILLA	182.	10	0.25	0.21	0.33
33 GTRA08 GT-85RE-08 POWR	0.	78.	153.	51.	55.	16.	10.	0.	163.	DISTILLA	163.	0	0.32	0.33	0.37
33 GTRA08 GT-85RE-08 HEAT	0.	91.	178.	60.	64.	19.	0.	-28.	178.	DISTILLA	150.	0	0.34	0.36	0.34
34 GTRA12 GT-85RE-12 POWR	0.	80.	152.	53.	55.	16.	8.	0.	161.	DISTILLA	161.	0	0.33	0.34	0.37
34 GTRA12 GT-85RE-12 HEAT	0.	91.	173.	60.	62.	18.	0.	-23.	173.	DISTILLA	150.	0	0.34	0.36	0.35
35 GTRA16 GT-85RE-16 POWR	0.	81.	156.	57.	55.	16.	4.	0.	160.	DISTILLA	160.	0	0.34	0.34	0.37
35 GTRA16 GT-85RE-16 HEAT	0.	86.	166.	60.	58.	17.	0.	-10.	166.	DISTILLA	156.	0	0.34	0.35	0.36
36 GTR208 GT-60RE-08 POWR	0.	71.	171.	69.	55.	16.	-10.	0.	171.	DISTILLA	171.	0	0.29	0.32	0.35
36 GTR208 GT-60RE-08 HEAT	0.	71.	149.	60.	48.	14.	0.	21.	149.	DISTILLA	171.	0	0.29	0.28	0.35
37 GTR212 GT-60RE-12 POWR	0.	76.	165.	64.	55.	16.	-5.	0.	165.	DISTILLA	165.	0	0.31	0.33	0.36
37 GTR212 GT-60RE-12 HEAT	0.	75.	155.	60.	51.	15.	0.	11.	155.	DISTILLA	166.	0	0.31	0.31	0.36
38 GTR216 GT-60RE-16 POWR	0.	79.	162.	62.	55.	16.	-3.	0.	162.	DISTILLA	162.	0	0.33	0.34	0.37
38 GTR216 GT-60RE-16 HEAT	0.	79.	156.	60.	53.	15.	0.	6.	156.	DISTILLA	162.	0	0.33	0.32	0.37
39 GTRW08 GT-85RE-08 POWR	0.	66.	156.	43.	55.	16.	20.	0.	175.	DISTILLA	175.	10	0.27	0.31	0.34
39 GTRW08 GT-85RE-08 HEAT	0.	92.	216.	60.	76.	22.	0.	-67.	216.	DISTILLA	150.	0	0.30	0.35	0.28
40 GTRW12 GT-85RE-12 POWR	0.	71.	150.	43.	55.	16.	21.	0.	171.	DISTILLA	171.	10	0.29	0.32	0.35
40 GTRW12 GT-85RE-12 HEAT	0.	100.	212.	60.	77.	23.	0.	-70.	212.	DISTILLA	141.	0	0.32	0.36	0.28

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33316 MW 16.00 PROCESS MILLIONS BTU/HR 60.0 PROCESS TEMP(F) 366. PRODUCT COPPER-SMELT HOURS PER YEAR 7620.

POWER TO HEAT RATIO 0.910

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	GTRW16	GT-85RE-16	POWR	0.	72.	153.	46.	55.	16.	17.	0.	169.	DISTILLA	169.	10	0.30	0.32	0.35
41	GTRW16	GT-85RE-16	HEAT	0.	94.	200.	60.	71.	21.	0.	-52.	200.	DISTILLA	148.	0	0.32	0.36	0.30
42	GTR308	GT-60RE-08	POWR	0.	61.	176.	56.	55.	16.	4.	0.	180.	DISTILLA	180.	10	0.25	0.30	0.33
42	GTR308	GT-60RE-08	HEAT	0.	65.	187.	60.	58.	17.	0.	-11.	187.	DISTILLA	176.	10	0.26	0.31	0.32
43	GTR312	GT-60RE-12	POWR	0.	73.	160.	53.	55.	16.	8.	0.	168.	DISTILLA	168.	10	0.30	0.33	0.36
43	GTR312	GT-60RE-12	HEAT	0.	83.	181.	60.	62.	18.	0.	-23.	181.	DISTILLA	158.	10	0.31	0.34	0.33
44	GTR316	GT-60RE-16	POWR	0.	73.	161.	54.	55.	16.	7.	0.	168.	DISTILLA	168.	10	0.30	0.32	0.36
44	GTR316	GT-60RE-16	HEAT	0.	81.	180.	60.	61.	18.	0.	-20.	180.	DISTILLA	160.	10	0.31	0.34	0.33
45	FCPADS	FUEL-CL-PH	POWR	0.	56.	144.	24.	55.	16.	42.	0.	186.	DISTILLA	186.	0	0.23	0.29	0.32
45	FCPADS	FUEL-CL-PH	HEAT	0.	137.	353.	60.	134.	39.	0.	-249.	353.	DISTILLA	104.	0	0.28	0.38	0.17
46	FCMCDS	FUEL-CL-MO	POWR	0.	74.	133.	31.	55.	16.	34.	0.	167.	DISTILLA	167.	0	0.31	0.33	0.36
46	FCMCDS	FUEL-CL-MO	HEAT	0.	145.	258.	60.	106.	31.	0.	-161.	258.	DISTILLA	97.	0	0.36	0.41	0.23

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33311 MW 756.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	0	0.	0.32	0.
1	STM141	STM-TURB-1	POWR	0.	340.	7721.	3983.	2579.	756.	-4686.	0.	7721.	RESIDUAL	7721.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	340.	7721.	3983.	2579.	756.	-4686.	0.	7721.	COAL-FGD	7721.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL-FGD	8061.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	340.	7721.	3983.	2579.	756.	-4686.	0.	7721.	COAL-AFB	7721.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL-AFB	8061.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-449.	8510.	4654.	2579.	756.	-5476.	0.	8510.	RESIDUAL	8510.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-449.	8510.	4654.	2579.	756.	-5476.	0.	8510.	COAL-FGD	8510.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL-FGD	8061.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-449.	8510.	4654.	2579.	756.	-5476.	0.	8510.	COAL-AFB	8510.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL-AFB	8061.	111	0.	0.	0.
3	PFBSTM	PFB-STMTB-	POWR	0.	1331.	6730.	3185.	2579.	756.	-3747.	0.	6730.	COAL-PFB	6730.	1	0.17	0.38	0.
3	PFBSTM	PFB-STMTB-	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL-PFB	8061.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	1844.	6217.	2662.	2579.	756.	-3131.	0.	6217.	RESIDUAL	6217.	1	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0
4	TISTMT	TI-STMTB-1	POWR	0.	1844.	6217.	2662.	2579.	756.	-3131.	0.	6217.	COAL	6217.	1	0.23	0.41	0
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL	8061.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-10272.	18333.	12963.	2579.	756.	-15251.	0.	18333.	RESIDUAL	18333.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-10272.	18333.	12963.	2579.	756.	-15251.	0.	18333.	COAL	18333.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL	8061.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-322.	8383.	3497.	2579.	756.	-4115.	0.	8383.	DISTILLA	8383.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33341 MW 756.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	-322.	8383.	3497.	2579.	756.	-4115.	0.	8383.	RESIDUAL	8383.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-322.	8383.	3497.	2579.	756.	-4115.	0.	8383.	COAL	8383.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL	8061.	111	0.	0.	0.
7	HEGT85	HELIUM-GT-	POWR	0.	25.	8036.	3590.	2579.	756.	-4224.	0.	8036.	COAL-AFB	8036.	1	0.00	0.32	0.
7	HEGT85	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL-AFB	8061.	111	0.	0.	0.
8	HEGT60	HELIUM-GT-	POWR	0.	-1899.	9959.	4280.	2579.	756.	-5035.	0.	9959.	COAL-AFB	9959.	1	-0.24	0.26	0.
8	HEGT60	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL-AFB	8061.	111	0.	0.	0.
9	HEGT00	HELIUM-GT-	POWR	0.	-6595.	14656.	8858.	2579.	756.	-10421.	0.	14656.	COAL-AFB	14656.	1	-0.82	0.18	0.
9	HEGT00	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL-AFB	8061.	111	0.	0.	0.
10	FCMCCL	FUEL-CL-MO	POWR	0.	-424.	8485.	4058.	2579.	756.	-4775.	0.	8485.	COAL	8485.	1	-0.05	0.30	0.
10	FCMCCL	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL	8061.	111	0.	0.	0.
11	FCSTCL	FUEL-CL-ST	POWR	0.	2816.	5245.	1507.	2579.	756.	-1773.	0.	5245.	COAL	5245.	1	0.35	0.49	0.
11	FCSTCL	FUEL-CL-ST	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL	8061.	111	0.	0.	0.
12	IGGTST	INT-GAS-GT	POWR	0.	1612.	6449.	1999.	2579.	756.	-2352.	0.	6449.	COAL	6449.	1	0.20	0.40	0.
12	IGGTST	INT-GAS-GT	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	COAL	8061.	111	0.	0.	0.
13	GTSOAR	GT-HRSG-10	POWR	0.	-834.	8395.	4395.	2579.	756.	-5170.	0.	8895.	RESIDUAL	8895.	1	-0.10	0.29	0.
13	GTSOAR	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
14	GTAC08	GT-HRSG-08	POWR	0.	-1493.	9554.	4589.	2579.	756.	-5398.	0.	9554.	RESIDUAL	9554.	1	-0.19	0.27	0.
14	GTAC08	GT-HRSG-08	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
15	GTAC12	GT-HRSG-12	POWR	0.	-396.	8457.	4365.	2579.	756.	-5135.	0.	8457.	RESIDUAL	8457.	1	-0.05	0.31	0.
15	GTAC12	GT-HRSG-12	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
16	GTAC16	GT-HRSG-16	POWR	0.	75.	7986.	4010.	2579.	756.	-4717.	0.	7986.	RESIDUAL	7986.	1	0.01	0.32	0.
16	GTAC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
17	GTWC16	GT-HRSG-16	POWR	0.	-128.	8189.	3268.	2579.	756.	-3845.	0.	8189.	RESIDUAL	8189.	1	-0.02	0.32	0.
17	GTWC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33341 MW 756.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	0.	2473.	5588.	1263.	2579.	756.	-1486.	0.	5588.	RESIDUAL	5588.	1	0.31	0.46	0.
18	CC1626	GTST-16/26	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
19	CC1622	GTST-16/22	POWR	0.	2476.	5584.	1398.	2579.	756.	-1645.	0.	5584.	RESIDUAL	5584.	1	0.31	0.46	0.
19	CC1622	GTST-16/22	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
20	CC1222	GTST-12/22	POWR	0.	2531.	5529.	1382.	2579.	756.	-1626.	0.	5529.	RESIDUAL	5529.	1	0.31	0.47	0.
20	CC1222	GTST-12/22	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
21	CC0822	GTST-08/22	POWR	0.	2469.	5592.	1653.	2579.	756.	-1945.	0.	5592.	RESIDUAL	5592.	1	0.31	0.46	0.
21	CC0822	GTST-08/22	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
22	STIG15	STIG-15-16	POWR	0.	1291.	6770.	88.	2579.	756.	-104.	0.	6770.	RESIDUAL	6770.	1	0.16	0.38	0.
22	STIG15	STIG-15-16	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
23	STIG10	STIG-10-16	POWR	0.	878.	7183.	952.	2579.	756.	-1120.	0.	7183.	RESIDUAL	7183.	1	0.11	0.36	0.
23	STIG10	STIG-10-16	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
24	STIG1S	STIG-1S-16	POWR	0.	366.	7695.	1622.	2579.	756.	-1908.	0.	7695.	RESIDUAL	7695.	1	0.05	0.34	0.
24	STIG1S	STIG-1S-16	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
25	DEADV3	DIESEL-ADV	POWR	0.	1108.	6953.	2502.	2579.	756.	-2943.	0.	6953.	RESIDUAL	6953.	1	0.14	0.37	0.
25	DEADV3	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
26	DEADV2	DIESEL-ADV	POWR	0.	1108.	6953.	1766.	2579.	756.	-2078.	0.	6953.	RESIDUAL	6953.	1	0.14	0.37	0.
26	DEADV2	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
27	DEADV1	DIESEL-ADV	POWR	0.	1108.	6953.	2719.	2579.	756.	-3198.	0.	6953.	RESIDUAL	6953.	1	0.14	0.37	0.
27	DEADV1	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
28	DEHTPM	ADV-DIESEL	POWR	0.	1631.	6429.	3274.	2579.	756.	-3852.	0.	6429.	RESIDUAL	6429.	1	0.20	0.40	0.
28	DEHTPM	ADV-DIESEL	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
29	DESOA3	DIESEL-SOA	POWR	0.	915.	7145.	2328.	2579.	756.	-2739.	0.	7145.	DISTILLA	7145.	1	0.11	0.36	0.
29	DESOA3	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
29	DESOA3	DIESEL-SOA	POWR	0.	915.	7145.	2328.	2579	756.	-2739.	0.	7145.	RESIDUAL	7145.	1	0.11	0.36	0.
29	DESOA3	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33341 MW 756.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6* 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30 DESOA2 DIESEL-SOA POWR	0.	915.	7145.	1572.	2579.	756.	-1849.	0.	7145.	DISTILLA	7145.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0
30 DESOA2 DIESEL-SOA POWR	0.	915.	7145.	1572.	2579.	756.	-1849.	0.	7145.	RESIDUAL	7145.	1	0.11	0.36	0.
30 DESOA2 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	915.	7145.	2865.	2579.	756.	-3371.	0.	7145.	DISTILLA	7145.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
31 DESOA1 DIESEL-SOA POWR	0.	915.	7145.	2865.	2579.	756.	-3371.	0.	7145.	RESIDUAL	7145.	1	0.11	0.36	0.
31 DESOA1 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	RESIDUAL	8061.	111	0.	0.	0.
32 GTSOAD GT-HRSG-10 POWR	0.	-773.	8834.	4760.	2579.	756.	-5600.	0.	8834.	DISTILLA	8834.	1	-0.10	0.29	0.
32 GTSOAD GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
33 GTRA08 GT-GORE-08 POWR	0.	835.	7225.	2918.	2579.	756.	-3432.	0.	7225.	DISTILLA	7225.	1	0.10	0.35	0.
33 GTRA08 GT-GORE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
34 GTRA12 GT-GORE-12 POWR	0.	856.	7205.	2953.	2579.	756.	-3475.	0.	7205.	DISTILLA	7205.	1	0.11	0.36	0.
34 GTRA12 GT-GORE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
35 GTRA16 GT-GORE-16 POWR	0.	670.	7391.	3142.	2579.	756.	-3696.	0.	7391.	DISTILLA	7391.	1	0.08	0.35	0.
35 GTRA16 GT-GORE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
36 GTR208 GT-GORE-08 POWR	0.	0.	8061.	3806.	2579.	756.	-4478.	0.	8061.	DISTILLA	8061.	1	0.	0.32	0.
36 GTR208 GT-GORE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
37 GTR212 GT-GORE-12 POWR	0.	244.	7817.	3498.	2579.	756.	-4115.	0.	7817.	DISTILLA	7817.	1	0.03	0.33	0.
37 GTR212 GT-GORE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
38 GTR216 GT-GORE-16 POWR	0.	407.	7654.	3418.	2579.	756.	-4021.	0.	7654.	DISTILLA	7654.	1	0.05	0.34	0
38 GTR216 GT-GORE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
39 GTRW08 GT-85RE-08 POWR	0.	712.	7349.	2427.	2579.	756.	-2855.	0.	7349.	DISTILLA	7349.	1	0.09	0.35	0.
39 GTRW08 GT-85RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
40 GTRW12 GT-85RE-12 POWR	0.	974.	7086.	2360.	2579.	756.	-2776.	0.	7086.	DISTILLA	7086.	1	0.12	0.36	0.
40 GTRW12 GT-85RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR

REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33311 MW 756.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET* TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41	GTRW16	GT-SORE-16	POWR	0.	835.	7225.	2531.	2579.	756.	-2978.	0.	7225.	DISTILLA	7225.	1	0.10	0.36	0.
41	GTRW16	GT-SORE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
42	GTR308	GT-6ORE-08	POWR	0.	-260.	8321.	3734.	2579.	756.	-4392.	0.	8321.	DISTILLA	8321.	1	-0.03	0.31	0.
42	GTR308	GT-6ORE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
43	GTR312	GT-6ORE-12	POWR	0.	519.	7542.	2878.	2579.	756.	-3386.	0.	7542.	DISTILLA	7542.	1	0.06	0.34	0.
43	GTR312	GT-6ORE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
44	GTR316	GT-6ORE-16	POWR	0.	452.	7609.	2925	2579.	756.	-3441.	0.	7609.	DISTILLA	7609.	1	0.06	0.34	0.
44	GTR316	GT-6ORE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
45	FCPADS	FUEL-CL-PH	POWR	0.	1273.	6788.	1154.	2579.	756.	-1358.	0.	6788.	DISTILLA	6788.	1	0.16	0.38	0.
45	FCPADS	FUEL-CL-PH	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.
46	FCMCDS	FUEL-CL-MO	POWR	0.	1800.	6261.	1459.	2579.	756.	-1716.	0.	6261.	DISTILLA	6261.	1	0.22	0.41	0
46	FCMCDS	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	8061.	0.	DISTILLA	8061.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33312 MW 378.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0 ONOCGN N O C O G O N	0.	0.	0.	0.	0.	0.	0.	4 0.	0.	DISTILLA	4030.	0	0.	0.32	0.
1 STM141 STM-TURB-1 POWR	0.	170.	3860.	1992.	1290.	378.	-2343.	0.	3860.	RESIDUAL	3860.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	170.	3860.	1992.	1290.	378.	-2343.	0.	3860.	COAL-FGD	3860.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL-FGD	4030.	111	0.	0.	0.
1 STM141 STM-TURB-1 POWR	0.	170.	3860.	1992.	1290.	378.	-2343.	0.	3860.	COAL-AFB	3860.	1	0.04	0.33	0.
1 STM141 STM-TURB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL-AFB	4030.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-225.	4255.	2327.	1290.	378.	-2738.	0.	4255.	RESIDUAL	4255.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-225.	4255.	2327.	1290.	378.	-2738.	0.	4255.	COAL-FGD	4255.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL-FGD	4030.	111	0.	0.	0.
2 STM088 STM-TURB-8 POWR	0.	-225.	4255.	2327.	1290.	378.	-2738.	0.	4255.	COAL-AFB	4255.	1	-0.06	0.30	0.
2 STM088 STM-TURB-8 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL-AFB	4030.	111	0.	0.	0.
3 PFBSTM PFB-STMTB- POWR	0.	666.	3365.	1593.	1290.	378.	-1874.	0.	3365.	COAL-PFB	3365.	1	0.17	0.38	0.
3 PFBSTM PFB-STMTB- HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL-PFB	4030.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	922.	3109.	1331.	1290.	378.	-1566.	0.	3109.	RESIDUAL	3109.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
4 TISTMT TI-STMTB-1 POWR	0.	922.	3109.	1331.	1290.	378.	-1566.	0.	3109.	COAL	3109.	1	0.23	0.41	0.
4 TISTMT TI-STMTB-1 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL	4030.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-5136.	9167.	6482.	1290.	378.	-7626.	0.	9167.	RESIDUAL	9167.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
5 TIHRSG THERMIONIC POWR	0.	-5136.	9167.	6482.	1290.	378.	-7626.	0.	9167.	COAL	9167.	1	-1.27	0.14	0.
5 TIHRSG THERMIONIC HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL	4030.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-161.	4192.	1749.	1290.	378.	-2057.	0.	4192.	DISTILLA	4192.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PFO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33342 MW 378.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0 PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6	STIRL	STIRLING-1	POWR	0.	-161.	4192.	1749.	1290.	378.	-2057.	0.	4192.	RESIDUAL	4192.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-161.	4192.	1749.	1290.	378.	-2057.	0.	4192.	COAL	4192.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL	4030.	111	0.	0.	0.
7	HEGT85	HELIUM-GT-	POWR	0.	13.	4018.	1795.	1290.	378.	-2112.	0.	4018.	COAL-AFB	4018.	1	0.00	0.32	0.
7	HEGT85	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL-AFB	4030.	111	0.	0.	0.
8	HEGT60	HELIUM-GT-	POWR	0.	-949.	4980.	2140.	1290.	378.	-2517.	0.	4980.	COAL-AFB	4980.	1	-0.24	0.26	0.
8	HEGT60	HELIUM-GT-	HEAT	0.	0	0.	0.	0.	0.	0.	4030.	0.	COAL-AFB	4030.	111	0.	0.	0.
9	HEGT00	HELIUM-GT-	POWR	0.	-3298.	7328.	4429.	1290.	378.	-5211.	0.	7328.	COAL-AFB	7328.	1	-0.82	0.18	0.
9	HEGT00	HELIUM-GT-	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL-AFB	4030.	111	0.	0.	0.
10	FCMCCL	FUEL-CL-MO	POWR	0.	-212.	4243.	2029.	1290.	378.	-2387.	0.	4243.	COAL	4243.	1	-0.05	0.30	0.
10	FCMCCL	FUEL-CL-MO	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL	4030.	111	0.	0.	0.
11	FCSTCL	FUEL-CL-ST	POWR	0.	1408.	2622.	753.	1290.	378.	-886.	0.	2622.	COAL	2622.	1	0.35	0.49	0.
11	FCSTCL	FUEL-CL-ST	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL	4030.	111	0.	0.	0.
12	IGGTST	INT-GAS-GT	POWR	0.	806.	3224.	1000.	1290.	378.	-1176.	0.	3224.	COAL	3224.	1	0.20	0.40	0.
12	IGGTST	INT-GAS-GT	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	COAL	4030.	111	0.	0.	0.
13	GTSOAR	GT-HRSG-10	POWR	0.	-417.	4447.	2197.	1290.	378.	-2585.	0.	4447.	RESIDUAL	4447.	1	-0.10	0.29	0.
13	GTSOAR	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
14	GTAC08	GT-HRSG-08	POWR	0.	-746.	4777.	2294.	1290.	378.	-2699.	0.	4777.	RESIDUAL	4777.	1	-0.19	0.27	0.
14	GTAC08	GT-HRSG-08	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
15	GTAC12	GT-HRSG-12	POWR	0.	-198.	4229.	2182.	1290.	378.	-2568.	0.	4229.	RESIDUAL	4229.	1	-0.05	0.31	0.
15	GTAC12	GT-HRSG-12	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
16	GTAC16	GT-HRSG-16	POWR	0.	37.	3993.	2005.	1290.	378.	-2359.	0.	3993.	RESIDUAL	3993.	1	0.01	0.32	0.
16	GTAC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
17	GTWC16	GT-HRSG-16	POWR	0.	-64.	4094.	1634.	1290.	378.	-1922.	0.	4094.	RESIDUAL	4094.	1	-0.02	0.32	0.
17	GTWC16	GT-HRSG-16	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

18SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33312 MW 378.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18 CC1626 GTST-16/26 POWR	0.	1236.	2794.	631.	1290.	378.	-743.	0.	2794.	RESIDUAL	2794.	1	0.31	0.46	0.
18 CC1626 GTST-16/26 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
19 CC1622 GTST-16/22 POWR	0.	1238.	2792.	699.	1290.	378.	-823.	0.	2792.	RESIDUAL	2792.	1	0.31	0.46	0.
19 CC1622 GTST-16/22 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
20 CC1222 GTST-12/22 POWR	0.	1266.	2765.	691.	1290.	378.	-813.	0.	2765.	RESIDUAL	2765.	1	0.31	0.47	0.
20 CC1222 GTST-12/22 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
21 CC0822 GTST-08/22 POWR	0.	1235.	2796.	827.	1290.	378.	-973.	0.	2796.	RESIDUAL	2796.	1	0.31	0.46	0.
21 CC0822 GTST-08/22 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
22 STIG15 STIG-15-16 POWR	0.	645.	3385.	44.	1290.	378.	-52.	0.	3385.	RESIDUAL	3385.	1	0.16	0.38	0.
22 STIG15 STIG-15-16 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
23 STIG10 STIG-10-16 POWR	0.	439.	3592.	476.	1290.	378.	-560.	0.	3592.	RESIDUAL	3592.	1	0.11	0.36	0.
23 STIG10 STIG-10-16 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
24 STIG1S STIG-1S-16 POWR	0.	183.	3848.	811.	1290.	378.	-954.	0.	3848.	RESIDUAL	3848.	1	0.05	0.34	0.
24 STIG1S STIG-1S-16 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
25 DEADV3 DIESEL-ADV POWR	0.	554.	3476.	1251.	1290.	378.	-1472.	0.	3476.	RESIDUAL	3476.	1	0.14	0.37	0.
25 DEADV3 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
26 DEADV2 DIESEL-ADV POWR	0.	554.	3476.	883.	1290.	378.	-1039.	0.	3476.	RESIDUAL	3476.	1	0.14	0.37	0.
26 DEADV2 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
27 DEADV1 DIESEL-ADV POWR	0.	554.	3476.	1359.	1290.	378.	-1599.	0.	3476.	RESIDUAL	3476.	1	0.14	0.37	0.
27 DEADV1 DIESEL-ADV HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
28 DEHTPM ADV-DIESEL POWR	0.	816.	3215.	1637.	1290.	378.	-1926.	0.	3215.	RESIDUAL	3215.	1	0.20	0.40	0.
28 DEHTPM ADV-DIESEL HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	458.	3573.	1164.	1290.	378.	-1369.	0.	3573.	DISTILLA	3573.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
29 DESOA3 DIESEL-SOA POWR	0.	458.	3573.	1164.	1290.	378.	-1369.	0.	3573.	RESIDUAL	3573.	1	0.11	0.36	0.
29 DESOA3 DIESEL-SOA HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33342 MW 378.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	458.	3573.	786.	1290.	378.	-925.	0.	3573.	DISTILLA	3573.	1	0.11	0.36	0.
30	DESOA2	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
30	DESOA2	DIESEL-SOA	POWR	0.	458.	3573.	786.	1290.	378.	-925.	0.	3573.	RESIDUAL	3573.	1	0.11	0.36	0.
30	DESOA2	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
31	DESOA1	DIESEL-SOA	POWR	0.	458.	3573.	1433.	1290.	378.	-1685.	0.	3573.	DISTILLA	3573.	1	0.11	0.36	0.
31	DESOA1	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
31	DESOA1	DIESEL-SOA	POWR	0.	458.	3573.	1433.	1290.	378.	-1685.	0.	3573.	RESIDUAL	3573.	1	0.11	0.36	0.
31	DESOA1	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	RESIDUAL	4030.	111	0.	0.	0.
32	GTSOAD	GT-HRSG-10	POWR	0.	-386.	4417.	2380.	1290.	378.	-2800.	0.	4417.	DISTILLA	4417.	1	-0.10	0.29	0.
32	GTSOAD	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
33	GTRA08	GT-65RE-08	POWR	0.	418.	3613.	1459.	1290.	378.	-1716.	0.	3613.	DISTILLA	3613.	1	0.10	0.36	0.
33	GTRA08	GT-65RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
34	GTRA12	GT-85RE-12	POWR	0.	428.	3603.	1477.	1290.	378.	-1737.	0.	3603.	DISTILLA	3603.	1	0.11	0.36	0.
34	GTRA12	GT-65RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
35	GTRA16	GT-65RE-16	POWR	0.	335.	3696.	1571.	1290.	378.	-1848.	0.	3696.	DISTILLA	3695.	1	0.08	0.35	0.
35	GTRA16	GT-65RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
36	GTR208	GT-60RE-08	POWR	0.	0.	4030.	1903.	1290.	378.	-2239.	0.	4030.	DISTILLA	4030.	1	0.	0.32	0.
36	GTR208	GT-60RE-03	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
37	GTR212	GT-60RE-12	POWR	0.	122.	3908.	1749.	1290.	378.	-2058.	0.	3908.	DISTILLA	3908.	1	0.03	0.33	0.
37	GTR212	GT-60RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
38	GTR216	GT-60RE-16	POWR	0.	203.	3827.	1709.	1290.	378.	-2010.	0.	3827.	DISTILLA	3827.	1	0.05	0.34	0.
38	GTR216	GT-60RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
39	GTRW08	GT-35RE-08	POWR	0.	356.	3674.	1213.	1290.	378.	-1427.	0.	3674.	DISTILLA	3674.	1	0.09	0.35	0.
39	GTRW08	GT-65RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
40	GTRW12	GT-65RE-12	POWR	0.	487.	3543.	1180.	1290.	378.	-1388.	0.	3543.	DISTILLA	3543.	1	0.12	0.36	0.
40	GTRW12	GT-65RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33312 MW 378.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	418.	3613.	1266.	1290.	378.	-1489.	0.	3613.	DISTILLA	3613.	1	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0
42 GTR308 GT-60RE-08 POWR	0.	-130.	4160.	1867.	1290.	378.	-2196.	0.	4160.	DISTILLA	4160.	1	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	259.	3771.	1439.	1290.	378.	-1693.	0.	3771.	DISTILLA	3771.	1	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	226.	3805.	1462.	1290.	378.	-1721.	0.	3805.	DISTILLA	3805.	1	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	636.	3394.	577.	1290.	378.	-679.	0.	3394.	DISTILLA	3394.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	900.	3130.	729.	1290.	378.	-858.	0.	3130.	DISTILLA	3130.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	4030.	0.	DISTILLA	4030.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PFO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33313 MW 153.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USFD 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
0	ONOCGN	N O C O G O N		0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	0	0.	0.32	0.
1	STM141	STM-TURB-1	POWR	0.	69.	1563.	806.	522.	153.	-948.	0.	1563.	RESIDUAL	1563.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	69.	1563.	806.	522.	153.	-948.	0.	1563.	COAL-FGD	1563.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL-FGD	1631.	111	0.	0.	0.
1	STM141	STM-TURB-1	POWR	0.	69.	1563.	806.	522.	153.	-948.	0.	1563.	COAL-AFB	1563.	1	0.04	0.33	0.
1	STM141	STM-TURB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL-AFB	1631.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-91.	1722.	942.	522.	153.	-1108.	0.	1722.	RESIDUAL	1722.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-91.	1722.	942.	522.	153.	-1108.	0.	1722.	COAL-FGD	1722.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL-FGD	1631.	111	0.	0.	0.
2	STM088	STM-TURB-8	POWR	0.	-91.	1722.	942.	522.	153.	-1108.	0.	1722.	COAL-AFB	1722.	1	-0.06	0.30	0.
2	STM088	STM-TURB-8	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL-AFB	1631.	111	0.	0.	0.
3	PFBSTM	PFB-STMTB-	POWR	0.	269.	1362.	645.	522.	153.	-758.	0.	1362.	COAL-PFB	1362.	1	0.17	0.38	0.
3	PFBSTM	PFB-STMTB-	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL-PFB	1631.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	373.	1258.	539.	522.	153.	-634.	0.	1258.	RESIDUAL	1258.	1	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
4	TISTMT	TI-STMTB-1	POWR	0.	373.	1258.	539.	522.	153.	-634.	0.	1258.	COAL	1258.	1	0.23	0.41	0.
4	TISTMT	TI-STMTB-1	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL	1631.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-2079.	3710.	2624.	522.	153.	-3087.	0.	3710.	RESIDUAL	3710.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
5	TIHRSG	THERMIONIC	POWR	0.	-2079.	3710.	2624.	522.	153.	-3087.	0.	3710.	COAL	3710.	1	-1.27	0.14	0.
5	TIHRSG	THERMIONIC	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL	1631.	111	0.	0.	0.
6	STIRL	STIRLING-1	POWR	0.	-65.	1697.	708.	522.	153.	-833.	0.	1697.	DISTILLA	1697.	1	-0.04	0.31	0.
6	STIRL	STIRLING-1	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33313 MW 153.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
6 STIRL STIRLING-1 POWR	0.	-65.	1697.	708.	522.	153.	-833.	0.	1697.	RESIDUAL	1697.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
6 STIRL STIRLING-1 POWR	0.	-65.	1697.	708.	522.	153.	-833.	0.	1697.	COAL	1697.	1	-0.04	0.31	0.
6 STIRL STIRLING-1 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL	1631.	111	0.	0.	0.
7 HEGT85 HELIUM-GT- POWR	0.	5.	1626.	727.	522.	153.	-855.	0.	1626.	COAL-AFB	1626.	1	0.00	0.32	0.
7 HEGT85 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL-AFB	1631.	111	0.	0.	0.
8 HEGT60 HELIUM-GT- POWR	0.	-384.	2016.	866.	522.	153.	-1019.	0.	2016.	COAL-AFB	2016.	1	-0.24	0.26	0.
8 HEGT60 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL-AFB	1631.	111	0.	0.	0.
9 HEGT00 HELIUM-GT- POWR	0.	-1335.	2966.	1793.	522.	153.	-2109.	0.	2966.	COAL-AFB	2966.	1	-0.82	0.18	0.
9 HEGT00 HELIUM-GT- HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL-AFB	1631.	111	0.	0.	0.
10 FCMCCL FUEL-CL-MO POWR	0.	-86.	1717.	821.	522.	153.	-966.	0.	1717.	COAL	1717.	1	-0.05	0.30	0.
10 FCMCCL FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL	1631.	111	0.	0.	0.
11 FCSTCL FUEL-CL-ST POWR	0.	570.	1061.	305.	522.	153.	-359.	0.	1061.	COAL	1061.	1	0.35	0.49	0.
11 FCSTCL FUEL-CL-ST HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL	1631.	111	0.	0.	0.
12 IGGTST INT-GAS-GT POWR	0.	326.	1305.	405.	522.	153.	-476.	0.	1305.	COAL	1305.	1	0.20	0.40	0.
12 IGGTST INT-GAS-GT HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	COAL	1631.	111	0.	0.	0.
13 GTSOAR GT-HRSG-10 POWR	0.	-169.	1800.	889.	522.	153.	-1046.	0.	1800.	RESIDUAL	1800.	1	-0.10	0.29	0.
13 GTSOAR GT-HRSG-10 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
14 GTAC08 GT-HRSG-08 POWR	0.	-302.	1933.	929.	522.	153.	-1093.	0.	1933.	RESIDUAL	1933.	1	-0.19	0.27	0.
14 GTAC08 GT-HRSG-08 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
15 GTAC12 GT-HRSG-12 POWR	0.	-80.	1712.	883.	522.	153.	-1039.	0.	1712.	RESIDUAL	1712.	1	-0.05	0.31	0.
15 GTAC12 GT-HRSG-12 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
16 GTAC16 GT-HRSG-16 POWR	0.	15.	1616.	811.	522.	153.	-955.	0.	1616.	RESIDUAL	1616.	1	0.01	0.32	0.
16 GTAC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
17 GTWC16 GT-HRSG-16 POWR	0.	-26.	1657.	661.	522.	153.	-778.	0.	1657.	RESIDUAL	1657.	1	-0.02	0.32	0.
17 GTWC16 GT-HRSG-16 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33313 MW 153.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
18	CC1626	GTST-16/26	POWR	0.	500.	1131.	256.	522.	153.	-301.	0.	1131.	RESIDUAL	1131.	1	0.31	0.46	0.
18	CC1626	GTST-16/26	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
19	CC1622	GTST-16/22	POWR	0.	501.	1130.	283.	522.	153.	-333.	[illegible]	[illegible]30.	RESIDUAL	1130.	1	0.31	0.46	0.
19	CC1622	GTST-16/22	HEAT	0.	0.	0.	0.	0.	0.	0.	16[illegible]	0.	RESIDUAL	1631.	111	0.	0.	0.
20	CC1222	GTST-12/22	POWR	0.	512.	1119.	280.	522.	153.	-329.	[illegible]	[illegible]9.	RESIDUAL	1119.	1	0.31	0.47	0.
20	CC1222	GTST-12/22	HEAT	0.	0.	0.	0.	0.	0.	0.	163[illegible]	0.	RESIDUAL	1631.	111	0.	0.	0.
21	CC0822	GTST-08/22	POWR	0.	500.	1132.	335.	522.	153.	-394.	0.	1132.	RESIDUAL	1132.	1	0.31	0.46	0.
21	CC0822	GTST-08/22	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
22	STIG15	STIG-15-16	POWR	0.	261.	1370.	18.	522.	153.	-21.	0.	1370.	RESIDUAL	1370.	1	0.13	0.33	0.
22	STIG15	STIG-15-16	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
23	STIG10	STIG-10-16	POWR	0.	178.	1454.	193.	522.	153.	-227.	0.	1454.	RESIDUAL	1454.	1	0.11	0.36	0.
23	STIG10	STIG-10-16	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
24	STIG1S	STIG-1S-16	POWR	0.	74.	1557.	328.	522.	153.	-386.	0.	1557.	RESIDUAL	1557.	1	0.05	0.34	0.
24	STIG1S	STIG-1S-16	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
25	DEADV3	DIESEL-ADV	POWR	0.	224.	1407.	506.	522.	153.	-596.	0.	1407.	RESIDUAL	1407.	1	0.14	0.37	0.
25	DEADV3	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
26	DEADV2	DIESEL-ADV	POWR	0.	224.	1407.	357.	522.	153.	-420.	0.	1407.	RESIDUAL	1407.	1	0.14	0.37	0.
26	DEADV2	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
27	DEADV1	DIESEL-ADV	POWR	0.	224.	1407.	550.	522.	153.	-647.	0.	1407.	RESIDUAL	1407.	1	0.14	0.37	0.
27	DEADV1	DIESEL-ADV	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
28	DEHTPM	ADV-DIESEL	POWR	0.	330.	1301.	663.	522.	153.	-779.	0.	1301.	RESIDUAL	1301.	1	0.20	0.40	0.
28	DEHTPM	ADV-DIESEL	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
29	DESOA3	DIESEL-SOA	POWR	0.	185.	1446.	471.	522.	153.	-554.	0.	1446.	DISTILLA	1446.	1	0.11	0.36	0.
29	DESOA3	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
29	DESOA3	DIESEL-SOA	POWR	0.	185.	1446.	471.	522.	153.	-554.	0.	1446.	RESIDUAL	1446.	1	0.11	0.36	0.
29	DESOA3	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

I&SE PEO ADV DESIGN ENGR REPORT 5.1

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33313 MW 153.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

				WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
30	DESOA2	DIESEL-SOA	POWR	0.	185.	1446.	318.	522.	153.	-374.	0.	1446.	DISTILLA	1446.	1	0.11	0.36	0.
30	DESOA2	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
30	DESOA2	DIESEL-SOA	POWR	0.	185.	1446.	318.	522.	153.	-374.	0.	1446.	RESIDUAL	1446.	1	0.11	0.36	0.
30	DESOA2	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
31	DESOA1	DIESEL-SOA	POWR	0.	185.	1446.	580.	522.	153.	-682.	0.	1446.	DISTILLA	1446.	1	0.11	0.36	0.
31	DESOA1	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
31	DESOA1	DIESEL-SOA	POWR	0.	185.	1446.	580.	522.	153.	-682.	0.	1446.	RESIDUAL	1446.	1	0.11	0.36	0.
31	DESOA1	DIESEL-SOA	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	RESIDUAL	1631.	111	0.	0.	0.
32	GTSOAD	GT-HRSG-10	POWR	0.	-156.	1788.	963.	522.	153.	-1133.	0.	1788.	DISTILLA	1788.	1	-0.10	0.29	0.
32	GTSOAD	GT-HRSG-10	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
33	GTRA08	GT-85RE-08	POWR	0.	169.	1462.	590.	522.	153.	-695.	0.	1462.	DISTILLA	1462.	1	0.10	0.36	0.
33	GTRA08	GT-85RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
34	GTRA12	GT-85RE-12	POWR	0.	173.	1458.	598.	522.	153.	-703.	0.	1458.	DISTILLA	1458.	1	0.11	0.36	0.
34	GTRA12	GT-85RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
35	GTRA16	GT-85RE-16	POWR	0.	136.	1496.	636.	522.	153.	-748.	0.	1496.	DISTILLA	1496.	1	0.08	0.35	0.
35	GTRA16	GT-85RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
36	GTR208	GT-60RE-08	POWR	0.	0.	1631.	770.	522.	153.	-906.	0.	1631.	DISTILLA	1631.	1	0.	0.32	0.
36	GTR208	GT-60RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
37	GTR212	GT-60RE-12	POWR	0.	49.	1582.	708.	522.	153.	-833.	0.	1582.	DISTILLA	1582.	1	0.03	0.33	0.
37	GTR212	GT-60RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
38	GTR216	GT-60RE-16	POWR	0.	82.	1549.	692.	522.	153.	-814.	0.	1549.	DISTILLA	1549.	1	0.05	0.34	0.
38	GTR216	GT-60RE-16	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
39	GTRW08	GT-85RE-08	POWR	0.	144.	1487.	491.	522.	153.	-578.	0.	1487.	DISTILLA	1487.	1	0.09	0.35	0.
39	GTRW08	GT-85RE-08	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
40	GTRW12	GT-85RE-12	POWR	0.	197.	1434.	478.	522.	153.	-562.	0.	1434.	DISTILLA	1434.	1	0.12	0.36	0.
40	GTRW12	GT-85RE-12	HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.

FUEL ENERGY SAVED BY PROCESS AND ECS

INDUSTRY 33543 MW 153.00 PROCESS MILLIONS BTU/HR 0. PROCESS TEMP(F) 0. PRODUCT ALUMINUM HOURS PER YEAR 8760.

POWER TO HEAT RATIO *****

UTILITY FUEL COAL WASTE FUEL EQV BTU*10**6= 0. HOT WATER BTU*10**6= 0.

	WASTE FUEL USED 10**6 BTU/HR	FUEL SAVED= NO-NET 10**6 BTU/HR	COGEN FUEL USED 10**6 BTU/HR	COGEN PROCES HEAT 10**6 BTU/HR	COGEN PROCES POWER 10**6 BTU/HR	COGEN MW ELECT	AUX PROCES BOILR 10**6 BTU/HR	UTILIT FUEL USED 10**6 BTU/HR	TOTAL FUEL SITE 10**6 BTU/HR	SITE FUEL USED	NET= TOTAL+ UTILIT 10**6 BTU/HR	FAIL	FESR	POWER FACTR	HEAT FACTR
41 GTRW16 GT-85RE-16 POWR	0.	169.	1462.	512.	522.	153.	-603.	0.	1462.	DISTILLA	1462.	1	0.10	0.36	0.
41 GTRW16 GT-85RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
42 GTR308 GT-60RE-08 POWR	0.	-53.	1684.	756.	522.	153.	-889.	0.	1684.	DISTILLA	1684.	1	-0.03	0.31	0.
42 GTR308 GT-60RE-08 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
43 GTR312 GT-60RE-12 POWR	0.	105.	1526.	582.	522.	153.	-685.	0.	1526.	DISTILLA	1526.	1	0.06	0.34	0.
43 GTR312 GT-60RE-12 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
44 GTR316 GT-60RE-16 POWR	0.	91.	1540.	592.	522.	153.	-696.	0.	1540	DISTILLA	1540.	1	0.06	0.34	0.
44 GTR316 GT-60RE-16 HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
45 FCPADS FUEL-CL-PH POWR	0.	258.	1374.	234.	522.	153.	-275.	0.	1374.	DISTILLA	1374.	1	0.16	0.38	0.
45 FCPADS FUEL-CL-PH HEAT	0.	0.	0.	0.	[illegible]	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.
46 FCMCDS FUEL-CL-MO POWR	0.	364.	1267.	295.	522.	153.	-347.	0.	1267.	DISTILLA	1267.	1	0.22	0.41	0.
46 FCMCDS FUEL-CL-MO HEAT	0.	0.	0.	0.	0.	0.	0.	1631.	0.	DISTILLA	1631.	111	0.	0.	0.

COAL-FIRED NOCOGENERATION PROCESS BOILER

5.2 - SUMMARY OF FUEL SAVED BY TYPE AND ECONOMICS

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I&SE-PEO-ADV-DES ENGR

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----------FUEL USE IN BTU 10**6----------																		
		NONCOGENERATION CASE			**NONCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
OHOCGH	10101	0.	25.	126.	0.	0.	0.	F	10.	0.	0.63	0.25	0.	12.3	1.00	260.1	0	6.0	1.00	80
STM141	10101	0.	84.	1.	0.	-59.	125.		10.	10.	0.57	0.25	0.44	8.3	0.68	141.8	999	3.9	0.66	176
STM141	10101	0.	0.	64.	0.	24.	42.	F	10.	10.	1.08	0.25	0.44	16.2	1.32	275.2	28	4.3	0.71	160
STM141	10101	0.	0.	64.	0.	24.	42.	A	10.	10.	0.96	0.25	0.44	12.5	1.01	211.6	999	3.7	0.63	164
STM086	10101	0.	80.	20.	0.	-55.	105.		10.	8.	0.54	0.25	0.33	7.4	0.60	132.5	999	4.3	0.71	166
STM086	10101	0.	6.	94.	0.	18.	32.	F	10.	8.	1.02	0.25	0.33	14.9	1.22	266.6	31	1.6	0.78	150
STM086	10101	0.	6.	91.	0.	18.	32.	A	10.	8.	0.92	0.25	0.33	11.8	0.96	209.8	999	4.2	0.70	154
PFBSTM	10101	0.	0.	65.	0.	25.	41.		10.	10.	1.59	0.25	0.44	20.8	1.69	351.2	10	5.3	0.88	169
PFBSTM	10101	0.	0.	106.	0.	37.	62.		10.	15.	1.45	0.25	0.48	19.9	1.62	304.3	17	4.4	0.74	160
TISTMT	10101	0.	122.	0.	0.	-97.	126.		10.	10.	1.27	0.25	0.19	29.6	2.41	499.5	0	8.0	1.34	143
TISTMT	10101	0.	77.	38.	0.	-52.	83.		10.	5.	1.01	0.25	0.23	20.5	1.67	381.1	0	6.6	1.10	136
TISTMT	10101	0.	0.	65.	0.	25.	41.		10.	10.	1.96	0.25	0.44	41.4	3.37	698.9	0	7.9	1.32	168
TISTMT	10101	0.	0.	126.	0.	49.	82.		10.	20.	2.15	0.25	0.51	57.1	4.65	800.9	0	6.6	1.44	160
TIHRSG	10101	0.	74.	63.	0.	-50.	62.		10.	2.	0.84	0.25	0.08	17.5	1.43	345.5	0	6.7	1.12	112
TIHRSG	10101	0.	4.	101.	0.	21.	25.		10.	8.	1.76	0.25	0.31	48.1	3.92	798.3	0	8.9	1.49	143
STIRL	10101	128.	0.	0.	-128.	25.	126.		10.	10.	0.77	0.25	0.15	11.1	0.91	173.1	-26	6.5	1.09	153
STIRL	10101	80.	9.	31.	-80.	15.	95.		10.	6.	0.70	0.25	0.20	9.3	0.76	160.7	999	5.7	0.95	149
STIRL	10101	0.	128.	0.	0.	-103.	126.		10.	10.	0.77	0.25	0.15	11.1	0.91	173.3	999	5.7	0.95	150
STIRL	10101	0.	89.	31.	0.	-65.	95.		10.	6.	0.70	0.25	0.20	9.3	0.76	160.8	999	5.2	0.86	147
STIRL	10101	0.	0.	102.	0.	25.	24.		10.	10.	1.44	0.25	0.32	21.9	1.78	340.5	9	5.5	0.92	155
STIRL	10101	0.	0.	179.	0.	57.	55.		10.	23.	1.43	0.25	0.38	28.1	2.29	323.2	9	5.0	0.83	137
HEGT85	10101	0.	0.	123.	0.	25.	2.	A	10.	10.	1.69	0.25	0.18	35.4	2.88	500.5	0	7.6	1.27	137
HEGT85	10101	0.	0.	531.	0.	150.	14.	A	10.	61.	3.34	0.25	0.24	91.7	7.46	482.4	0	12.8	2.14	113
HEGT60	10101	0.	0.	122.	0.	25.	4.	A	10.	10.	1.66	0.25	0.19	34.0	2.76	484.4	0	7.4	1.24	139
HEGT60	10101	0.	0.	278.	0.	74.	12.	A	10.	30.	2.12	0.25	0.24	55.1	4.49	476.1	0	9.1	1.52	120
HEGT00	10101	0.	0.	122.	0.	25.	3.	A	10.	10.	1.56	0.25	0.19	31.2	2.54	441.5	0	7.0	1.17	138
HEGT00	10101	0.	0.	154.	0.	34.	5.	A	10.	14.	1.41	0.25	0.20	33.4	2.72	419.9	0	6.9	1.15	126
FCMCCL	10101	0.	0.	211.	0.	25.	-85.		10.	10.	1.72	0.25	-0.40	29.8	2.43	483.1	0	8.6	1.44	71
FCMCCL	10101	0.	0.	289.	0.	63.	-34.		10.	26.	2.09	0.25	0.09	40.3	3.28	476.4	0	8.5	1.43	107
FCSTCL	10101	0.	0.	208.	0.	25.	-83.		10.	10.	1.73	0.25	-0.39	29.0	2.36	474.6	0	8.5	1.42	73
FCSTCL	10101	0.	0.	359.	0.	102.	28.		10.	42.	2.65	0.25	0.27	50.3	4.09	478.2	0	8.4	1.41	113
IGGIST	10101	0.	0.	220.	0.	25.	-94.		10.	10.	1.61	0.25	-0.47	28.9	2.35	448.2	0	8.5	1.43	64
IGGIST	10101	0.	0.	335.	0.	72.	-49.		10.	29.	1.64	0.25	0.06	40.4	3.29	412.3	0	8.2	1.37	99
GTSOAR	10101	0.	118.	0.	0.	-93.	126.		10.	10.	0.71	0.25	0.22	10.6	0.86	166.2	999	5.3	0.88	158
GTSOAR	10101	0.	91.	24.	0.	-66.	102.		10.	7.	0.67	0.25	0.24	9.6	0.78	162.0	999	5.0	0.84	151
GTAC08	10101	0.	126.	0.	0.	-102.	126.		10.	10.	0.68	0.25	0.16	9.6	0.78	155.0	999	5.4	0.90	154
GTAC08	10101	0.	83.	35.	0.	-58.	90.		10.	6.	0.63	0.25	0.21	8.3	0.68	149.7	999	1.9	0.83	150
GTAC12	10101	0.	112.	0.	0.	-87.	126.		10.	10.	0.68	0.25	0.25	9.8	0.80	157.8	999	5.0	0.83	164
GTAC12	10101	0.	86.	24.	0.	-62.	102.		10.	7.	0.65	0.25	0.27	8.8	0.72	153.2	999	4.8	0.80	155
GTAC16	10101	0.	106.	0.	0.	-81.	126.		10.	10.	0.69	0.25	0.30	10.1	0.82	162.3	999	4.8	0.81	167
GTAC16	10101	0.	89.	17.	0.	-64.	109.		10.	8.	0.66	0.25	0.30	9.4	0.76	159.0	999	4.7	0.73	158
GTWC16	10101	0.	108.	0.	0.	-84.	126.		10.	10.	0.70	0.25	0.28	10.4	0.85	162.9	999	5.0	0.83	165
GTWC16	10101	0.	95.	13.	0.	-71.	113.		10.	8.	0.68	0.25	0.28	9.9	0.80	161.1	999	4.9	0.82	155

		-----------FUEL USE IN BTU-10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHGS	ENRG	
CC1626	10101	0.	100.	0.	0.	-76.	126.	10.	10.	0.80	0.25	0.33	10.7	0.87	166.8	999	4.9	0.82	171
CC1626	10101	0.	124.	0.	0.	-89.	159.	10.	14.	0.86	0.25	0.36	12.1	0.98	170.9	999	5.0	0.84	160
CC1622	10101	0.	98.	0.	0.	-74.	126.	10.	10.	0.79	0.25	0.35	10.4	0.84	164.0	999	4.8	0.80	173
CC1622	10101	0.	113.	0.	0.	-82.	148.	10.	13.	0.83	0.25	0.37	11.3	0.92	167.9	999	4.8	0.81	162
CC1222	10101	0.	98.	0.	0.	-73.	126.	10.	10.	0.78	0.25	0.35	10.1	0.82	160.2	999	4.7	0.79	174
CC1222	10101	0.	112.	0.	0.	-81.	146.	10.	13.	0.82	0.25	0.37	11.0	0.90	163.5	999	4.8	0.80	163
CC0822	10101	0.	94.	0.	0.	-69.	126.	10.	10.	0.78	0.25	0.37	10.2	0.83	164.9	999	4.6	0.77	176
CC0822	10101	0.	95.	0.	0.	-70.	127.	10.	10.	0.79	0.25	0.38	10.3	0.84	165.1	999	4.6	0.77	165
STIG15	10101	0.	132.	0.	0.	-107.	126.	10.	10.	0.81	0.25	0.12	10.7	0.87	146.1	999	5.8	0.97	148
STIG15	10101	0.	2846.	0.	0.	-2067.	2653.	10.	318.	5.91	0.25	0.17	97.7	7.95	112.4	0	42.2	7.06	220
STIG10	10101	0.	124.	0.	0.	-99.	126.	10.	10.	0.77	0.25	0.18	10.2	0.83	144.5	999	5.4	0.91	155
STIG10	10101	0.	279.	0.	0.	-207.	285.	10.	29.	1.09	0.25	0.22	16.0	1.30	137.8	0	7.3	1.23	132
STIG1S	10101	0.	120.	0.	0.	-96.	126.	10.	10.	0.76	0.25	0.20	10.0	0.82	144.0	999	5.3	0.89	158
STIG1S	10101	0.	176.	0.	0.	-133.	185.	10.	17.	0.89	0.25	0.23	12.2	1.00	142.6	0	6.0	1.00	145
DEADV3	10101	0.	110.	0.	0.	-86.	126.	10.	10.	0.82	0.25	0.27	13.3	1.08	198.5	46	5.4	0.91	159
DEADV3	10101	0.	159.	0.	0.	-117.	185.	10.	17.	0.91	0.25	0.30	16.6	1.36	205.4	5	6.0	1.00	146
DEHTFH	10101	0.	97.	0.	0.	-73.	126.	10.	10.	0.84	0.25	0.35	13.0	1.06	212.9	101	5.1	0.85	169
DEHTFH	10101	0.	88.	10.	0.	-64.	116.	10.	9.	0.82	0.25	0.34	12.5	1.02	210.6	999	5.0	0.84	158
DESOA3	10101	116.	0.	0.	-116.	25.	126.	10.	10.	0.84	0.25	0.23	13.9	1.13	203.3	0	6.4	1.08	157
DESOA3	10101	186.	0.	0.	-186.	48.	205.	10.	20.	1.06	0.25	0.27	21.3	1.74	239.9	0	8.2	1.37	144
DESOA3	10101	0.	116.	0.	0.	-91.	126.	10.	10.	0.84	0.25	0.23	13.9	1.13	203.3	18	5.7	0.95	154
DESOA3	10101	0.	186.	0.	0.	-138.	205.	10.	20.	1.08	0.25	0.27	21.3	1.74	239.9	0	7.0	1.17	139
GTSOAD	10101	117.	0.	0.	-117.	25.	126.	10.	10.	0.67	0.25	0.22	9.3	0.76	149.0	0	5.8	0.98	164
GTSOAD	10101	79.	8.	27.	-79.	17.	99.	10.	7.	0.64	0.25	0.24	8.4	0.69	146.2	999	5.3	0.89	156
GTRA08	10101	98.	0.	0.	-98.	25.	126.	10.	10.	0.72	0.25	0.34	11.0	0.90	173.8	999	5.4	0.90	174
GTRA08	10101	102.	0.	0.	-102.	26.	131.	10.	11.	0.73	0.25	0.35	11.3	0.92	174.9	999	5.4	0.91	163
GTRA12	10101	98.	0.	0.	-98.	25.	126.	10.	10.	0.72	0.25	0.35	11.0	0.89	174.1	999	5.4	0.90	174
GTRA12	10101	101.	0.	0.	-101.	26.	130.	10.	11.	0.72	0.25	0.36	11.2	0.91	175.1	999	5.4	0.90	164
GTRA16	10101	98.	0.	0.	-98.	25.	126.	10.	10.	0.72	0.25	0.35	11.3	0.92	180.0	999	5.4	0.91	173
GTRA16	10101	97.	0.	1.	-97.	24.	125.	10.	10.	0.72	0.25	0.35	11.3	0.92	179.8	999	5.4	0.90	163
GTR208	10101	107.	0.	0.	-107.	25.	126.	10.	10.	0.70	0.25	0.29	10.4	0.85	165.5	999	5.6	0.94	169
GTR208	10101	89.	4.	14.	-89.	20.	112.	10.	8.	0.68	0.25	0.29	9.8	0.80	163.0	999	5.4	0.90	159
GTR212	10101	103.	0.	0.	-103.	25.	126.	10.	10.	0.71	0.25	0.31	10.7	0.87	169.3	999	5.5	0.93	171
GTR212	10101	92.	3.	9.	-92.	22.	117.	10.	9.	0.69	0.25	0.31	10.3	0.84	167.5	999	5.4	0.91	160
GTR216	10101	101.	0.	0.	-101.	25.	126.	10.	10.	0.71	0.25	0.33	10.9	0.89	173.6	999	5.5	0.92	172
GTR216	10101	92.	2.	7.	-92.	22.	118.	10.	9.	0.70	0.25	0.32	10.6	0.86	171.9	999	5.4	0.90	161
GTRW08	10101	107.	0.	0.	-107.	25.	126.	10.	10.	0.72	0.25	0.29	11.1	0.90	168.8	999	5.7	0.96	168
GTRW08	10101	125.	0.	0.	-125.	32.	149.	10.	13.	0.76	0.25	0.31	12.2	0.99	170.9	-6	6.0	1.00	157
GTRW12	10101	104.	0.	0.	-104.	25.	126.	10.	10.	0.72	0.25	0.31	11.1	0.90	170.7	999	5.6	0.94	169
GTRW12	10101	124.	0.	0.	-124.	32.	152.	10.	13.	0.77	0.25	0.33	12.3	1.00	173.4	999	5.9	0.99	159
GTRW16	10101	104.	0.	0.	-104.	25.	126.	10.	10.	0.73	0.25	0.31	11.4	0.93	175.3	999	5.6	0.94	169
GTRW16	10101	118.	0.	0.	-118.	30.	145.	10.	12.	0.76	0.25	0.33	12.3	1.00	177.8	999	5.8	0.98	159
GTR308	10101	110.	0.	0.	-110.	25.	126.	10.	10.	0.71	0.25	0.27	10.6	0.86	159.1	999	5.8	0.96	166
GTR308	10101	108.	1.	2.	-108.	24.	124.	10.	10.	0.71	0.25	0.27	10.5	0.85	159.0	999	5.7	0.96	156

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTR312	10101	103.	0.	0.	-103.	25.	126.	10.	10.	0.71	0.25	0.31	10.7	0.87	164.8	999	5.5	0.93	171
GTR312	10101	109.	0.	0.	-109.	27.	133.	10.	11.	0.72	0.25	0.32	11.0	0.89	165.6	999	5.6	0.94	161
GTR316	10101	104.	0.	0.	-104.	25.	126.	10.	10.	0.72	0.25	0.31	11.0	0.89	169.4	999	5.6	0.93	170
GTR316	10101	108.	0.	0.	-108.	26.	132.	10.	11.	0.73	0.25	0.32	11.3	0.92	170.2	999	5.6	0.94	160
FCPADS	10101	115.	0.	0.	-115.	25.	126.	10.	10.	1.53	0.25	0.23	11.7	0.95	171.3	-60	6.9	1.15	164
FCPADS	10101	218.	0.	0.	-218.	59.	243.	10.	24.	3.02	0.25	0.28	19.6	1.60	199.7	0	10.2	1.71	152
FCMCDS	10101	104.	0.	0.	-104.	25.	126.	10.	10.	1.47	0.25	0.31	12.1	0.99	186.9	-62	6.4	1.08	171
FCMCDS	10101	159.	0.	0.	-159.	47.	201.	10.	19.	2.37	0.25	0.36	17.4	1.42	214.9*	0	8.2	1.37	160

SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROGS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	10102	0.	74.	729.	0.	0.	0.	F	30.	0.	1.52	0.25	0.	25.2	1.00	178.4	0	21.6	1.00	80
STM141	10102	0.	602.	3.	0.	-529.	726.		30.	30.	0.98	0.25	0.25	19.0	0.75	107.7	999	20.6	0.95	156
STM141	10102	0.	1.	604.	0.	73.	124.	F	30.	30.	2.01	0.25	0.25	34.5	1.37	195.9	36	16.0	0.74	136
STM141	10102	0.	1.	604.	0.	73.	124.	A	30.	30.	1.95	0.25	0.25	29.8	1.18	169.1	69	15.4	0.71	139
STM088	10102	0.	591.	61.	0.	-518.	667.		30.	23.	0.93	0.25	0.19	17.2	0.68	102.2	-6	21.8	1.01	132
STM088	10102	0.	18.	634.	0.	55.	94.	F	30.	23.	1.89	0.25	0.19	32.1	1.27	191.5	37	17.3	0.80	131
STM088	10102	0.	18.	634.	0.	55.	94.	A	30.	23.	1.75	0.25	0.19	23.4	0.93	139.2	999	16.3	0.75	138
PFBSTM	10102	0.	0.	606.	0.	74.	123.		30.	30.	3.12	0.25	0.25	42.4	1.68	239.1	17	17.9	0.83	144
PFBSTM	10102	0.	0.	669.	0.	111.	186.		30.	45.	3.13	0.25	0.31	41.0	1.63	209.0	24	16.0	0.74	138
TISTMT	10102	0.	606.	0.	0.	-532.	729.		30.	30.	2.40	0.25	0.24	65.9	2.61	371.3	0	27.2	1.26	147
TISTMT	10102	0.	728.	0.	0.	-581.	972.		30.	60.	3.11	0.25	0.35	101.7	4.03	477.0	0	29.8	1.38	140
TISTMT	10102	0.	0.	606.	0.	74.	123.		30.	30.	3.78	0.25	0.24	91.4	3.63	515.1	2	23.9	1.10	138
TISTMT	10102	0.	0.	728.	0.	146.	244.		30.	60.	4.45	0.25	0.35	128.5	5.09	602.4	2	25.2	1.16	132
TIHRSG	10102	0.	627.	38.	0.	-553.	691.		30.	25.	2.52	0.25	0.17	84.9	3.37	470.5	0	30.8	1.42	127
TIHRSG	10102	0.	11.	654.	0.	62.	75.		30.	25.	3.72	0.25	0.17	108.6	4.31	601.8	0	27.3	1.26	120
STIRL	10102	657.	0.	0.	-657.	74.	729.		30.	30.	1.43	0.25	0.18	28.9	1.14	149.8	0	27.9	1.29	157
STIRL	10102	887.	0.	0.	-887.	170.	1051.		30.	69.	1.71	0.25	0.27	46.9	1.86	180.6	0	31.0	1.43	142
STIRL	10102	0.	657.	0.	0.	-584.	729.		30.	30.	1.43	0.25	0.18	28.9	1.15	149.9	0	23.6	1.09	152
STIRL	10102	0.	887.	0.	0.	-717.	1051.		30.	69.	1.71	0.25	0.27	47.0	1.86	180.8	0	25.2	1.17	135
STIRL	10102	0.	0.	657.	0.	74.	71.		30.	30.	2.85	0.25	0.18	54.2	2.15	281.6	10	19.7	0.91	133
STIRL	10102	0.	0.	887.	0.	170.	165.		30.	69.	3.40	0.25	0.27	[illegible]	3.26	315.9	7	19.8	0.91	119
HEGT85	10102	0.	0.	722.	0.	74.	7.	A	30.	30.	3.34	0.25	0.10	75.4	2.99	356.6	1	23.7	1.10	122
HEGT85	10102	0.	0.	1941.	0.	448.	41.	A	30.	183.	7.47	0.25	0.20	199.4	7.91	350.7	0	33.6	1.55	94
HEGT60	10102	0.	0.	716.	0.	74.	12.	A	30.	30.	3.27	0.25	0.11	72.4	2.87	344.8	2	23.2	1.07	123
HEGT60	10102	0.	0.	1183.	0.	220.	37.	A	30.	90.	4.65	0.25	0.18	119.5	4.74	344.8	0	26.5	1.23	105
HEGT00	10102	0.	0.	719.	0.	74.	10.	A	30.	30.	3.13	0.25	0.10	67.1	2.66	318.9	3	22.5	1.04	124
HEGT00	10102	0.	0.	812.	0.	103.	14.	A	30.	42.	3.05	0.25	0.13	72.5	2.87	304.6	3	22.4	1.04	113
FCMCCL	10102	0.	0.	631.	0.	74.	98.		30.	30.	3.52	0.25	0.21	64.3	2.55	348.0	5	21.3	0.98	136
FCMCCL	10102	0.	0.	864.	0.	189.	250.		30.	77.	4.87	0.25	0.34	88.8	3.52	351.1	6	20.6	0.95	125
FCSTCL	10102	0.	0.	624.	0.	74.	104.		30.	30.	3.43	0.25	0.22	62.3	2.47	340.6	6	20.9	0.96	138
FCSTCL	10102	0.	0.	1074.	0.	307.	435.		30.	125.	6.12	0.25	0.41	111.0	4.40	352.8	7	19.0	0.88	117
IGGTST	10102	0.	0.	659.	0.	74.	70.		30.	30.	2.85	0.25	0.18	60.0	2.38	310.6	7	20.6	0.95	133
IGGTST	10102	0.	0.	1001.	0.	216.	205.		30.	88.	3.06	0.25	0.30	87.3	3.46	297.5	8	18.9	0.87	115
GTSOAR	10102	0.	652.	0.	0.	-578.	729.		30.	30.	1.21	0.25	0.19	22.9	0.91	119.8	-23	22.6	1.04	157
GTSOAR	10102	0.	926.	0.	0.	-733.	1129.		30.	79.	1.30	0.25	0.30	33.8	1.34	124.6	0	22.8	1.06	140
GTAC08	10102	0.	633.	0.	0.	-560.	729.		30.	30.	1.16	0.25	0.21	21.0	0.83	113.2	-7	21.8	1.01	161
GTAC08	10102	0.	801.	0.	0.	-646.	1003.		30.	63.	1.07	0.25	0.31	25.3	1.00	107.9	999	20.9	0.97	150
GTAC12	10102	0.	633.	0.	0.	-560.	729.		30.	30.	1.18	0.25	0.21	21.7	0.86	116.8	-9	21.9	1.01	161
GTAC12	10102	0.	876.	0.	0.	-684.	1125.		30.	78.	1.20	0.25	0.33	30.1	1.19	117.4	15	21.0	0.97	145
GTAC16	10102	0.	635.	0.	0.	-561.	729.		30.	30.	1.23	0.25	0.21	23.8	0.94	128.0	-21	22.2	1.03	158
GTAC16	10102	0.	929.	0.	0.	-714.	1205.		30.	88.	1.31	0.25	0.35	34.2	1.36	125.8	8	21.3	0.98	141
GTWC16	10102	0.	653.	0.	0.	-579.	729.		30.	30.	1.23	0.25	0.19	23.7	0.94	123.6	-32	22.7	1.05	156
GTWC16	10102	0.	1015	0.	0.	-785.	1252.		30.	94.	1.30	0.25	0.31	33.0	1.31	111.1	0	22.6	1.04	138

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
CC1626	10102	0.	653.	0.	0.	-579.	729.	30.	30.	1.43	0.25	0.19	27.1	1.08	141.9	0	23.4	1.08	154
CC1626	10102	0.	1373.	0.	0.	-989.	1767.	30.	157.	1.83	0.25	0.36	48.3	1.91	120.0	0	23.7	1.09	124
CC1622	10102	0.	[illegible]	0.	0.	-572.	729.	30.	30.	1.42	0.25	0.19	27.1	1.07	143.2	0	23.1	1.07	154
CC1622	10102	0.	1251.	0.	0.	-905.	1640.	30.	141.	1.86	0.25	0.37	49.1	1.95	133.9	0	23.1	1.07	126
CC1222	10102	0.	644.	0.	0.	-571.	729.	30.	30.	1.41	0.25	0.20	26.5	1.05	140.1	0	23.0	1.06	155
CC1222	10102	0.	1242.	0.	0.	-897.	1636.	30.	141.	1.82	0.25	0.37	46.3	1.84	127.3	0	22.5	1.04	127
CC0822	10102	0.	633.	0.	0.	-560.	729.	30.	30.	1.40	0.25	0.21	26.2	1.04	141.0	0	22.7	1.05	157
CC0822	10102	0.	1049.	0.	0.	-773.	1407.	30.	113.	1.53	0.25	0.38	36.3	1.44	117.9	11	20.7	0.96	137
STIG15	10102	0.	747.	0.	0.	-673.	729.	30.	30.	1.59	0.25	0.07	27.5	1.09	125.8	0	26.2	1.21	142
STIG15	10102	0.	31538.	0.	0.	-22902.	29396.	30.	3522.	51.42	0.25	0.17	861.5	34.16	93.2	0	415.1	19.18	517
STIG10	10102	0.	723.	0.	0.	-649.	729.	30.	30.	1.49	0.25	0.10	26.5	1.05	125.0	0	25.3	1.17	145
STIG10	10102	0.	3094.	0.	0.	-2296.	3156.	30.	326.	4.83	0.25	0.22	94.6	3.75	104.3	0	50.2	2.32	116
STIG1S	10102	0.	712.	0.	0.	-638.	729.	30.	30.	1.48	0.25	0.11	26.0	1.03	124.5	0	24.9	1.15	147
STIG1S	10102	0.	1945.	0.	0.	-1476.	2051.	30.	191.	3.08	0.25	0.23	55.2	2.19	96.9	0	35.8	1.65	114
DEADV3	10102	0.	683.	0.	0.	-609.	729.	30.	30.	1.60	0.25	0.15	35.9	1.42	179.3	0	25.3	1.17	144
DEADV3	10102	0.	1760.	0.	0.	-1291.	2054.	30.	191.	3.82	0.25	0.30	125.1	4.96	242.5	0	38.4	1.78	115
DEHTPM	10102	0.	626.	0.	0.	-552.	729.	30.	30.	1.57	0.25	0.22	32.8	1.30	178.7	0	23.2	1.07	153
DEHTPM	10102	0.	947.	0.	0.	-708.	1280.	30.	97.	2.38	0.25	0.38	69.4	2.75	250.3	0	24.8	1.15	133
DESOA3	10102	700.	0.	0.	-700.	74.	729.	30.	30.	1.73	0.25	0.13	40.8	1.62	199.0	0	31.0	1.43	146
DESOA3	10102	2061.	0.	0.	-2061.	535.	2273.	30.	218.	5.14	0.25	0.27	176 2	6.99	291.8	0	62.5	2.89	133
DESOA3	10102	0.	700.	0.	0.	-626.	729.	30.	30.	1.73	0.25	0.13	40.8	1.62	199.0	0	26.4	1.22	140
DESOA3	10102	0.	2061.	0.	0.	-1526.	2273.	30.	218.	5.14	0.25	0.27	176.2	6.99	291.8	0	49.0	2.26	117
GTSOAD	10102	640.	0.	0.	-640.	74.	729.	30.	30.	1.15	0.25	0.20	20.4	0.81	108.7	-47	26.1	1.21	166
GTSOAD	10102	875.	0.	0.	-875.	184.	1097.	30.	75.	1.10	0.25	0.32	26.3	1.04	102.5	0	26.8	1.24	154
GTRA08	10102	647.	0.	0.	-647.	74.	729.	30.	30.	1.34	0.25	0.19	28.0	1.11	147.8	0	27.4	1.27	158
GTRA08	10102	1134.	0.	0.	-1134.	291.	1457.	30.	119.	1.62	0.25	0.35	45.0	1.78	135.4	0	30.4	1.41	139
GTRA12	10102	645.	0.	0.	-645.	74.	729.	30.	30.	1.35	0.25	0.20	28.3	1.12	149.6	0	27.3	1.26	158
GTRA12	10102	1115.	0.	0.	-1115.	287.	1443.	30.	117.	1.63	0.25	0.36	45.7	1.81	139.9	0	30.2	1.39	139
GTRA16	10102	644.	0.	0.	-644.	74.	729.	30.	30.	1.29	0.25	0.20	26.1	1.03	138.2	0	27.0	1.25	160
GTRA16	10102	1075.	0.	0.	-1075.	270.	1385.	30.	110.	1.64	0.25	0.35	46.1	1.83	146.4	0	30.1	1.39	140
GTR208	10102	645.	0.	0.	-645.	74.	729.	30.	30.	1.24	0.25	0.20	24.0	0.95	127.0	135	26.8	1.24	162
GTR208	10102	982.	0.	0.	-982.	226.	1238.	30.	92.	1.39	0.25	0.33	36.8	1.46	127.7	0	28.8	1.33	145
GTR212	10102	646.	0.	0.	-646.	74.	729.	30.	30.	1.26	0.25	0.19	24.6	0.97	129.8	193	26.9	1.24	161
GTR212	10102	1022.	0.	0.	-1022.	242.	1294.	30.	99.	1.46	0.25	0.33	39.5	1.57	131.9	0	29.4	1.36	143
GTR216	10102	643.	0.	0.	-643.	74.	729.	30.	30.	1.27	0.25	0.20	25.3	1.00	134.0	999	26.9	1.24	161
GTR216	10102	1024.	0.	0.	-1024.	248.	1313.	30.	101.	1.53	0.25	0.34	42.2	1.67	140.6	0	29.4	1.36	142
GTRU08	10102	672.	0.	0.	-672.	74.	729.	30.	30.	1.35	0.25	0.16	27.9	1.11	141.8	0	28.3	1.31	155
GTRU03	10102	1385.	0.	0.	-1385.	349.	1652.	30.	142.	1.70	0.25	0.31	47.1	1.87	116.0	0	35.3	1.63	133
GTRW12	10102	665.	0.	0.	-665.	74.	729.	30.	30.	1.34	0.25	0.17	27.9	1.11	143.5	0	28.0	1.29	156
GTRW12	10102	1370.	0.	0.	-1370.	359.	1683.	30.	146.	1.72	0.25	0.33	47.7	1.89	118.8	0	34.2	1.58	134
GTRW16	10102	663.	0.	0.	-663.	74.	729.	30.	30.	1.36	0.25	0.17	28.5	1.13	146.5	0	28.0	1.30	156
GTRW16	10102	1306.	0.	0.	-1306.	335.	1604.	30.	137	1.70	0.25	0.33	47.5	1.88	124.0	0	33.6	1.55	134
GTR308	10102	679.	0.	0.	-679.	74.	729.	30.	30.	1.25	0.25	0.15	24.0	0.95	120.8	166	28.0	1.29	158
GTR308	10102	1193.	0.	0.	-1193.	266.	1372.	30.	108.	1.42	0.25	0.27	36.9	1.46	105.6	0	33.4	1.54	139

GENERAL ELEC..IC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTR312	10102	662.	0.	0.	-662.	74.	729.	30.	30.	1.32	0.25	0.17	27.0	1.07	139.4	0	27.8	1.28	157
GTR312	10102	1205.	0.	0.	-1205.	296.	1474.	30.	121.	1.53	0.25	0.32	41.1	1.63	116.4	0	32.1	1.48	138
GTR316	10102	663.	0.	0.	-663.	74.	729.	30.	30.	1.34	0.25	0.17	27.7	1.10	142.5	0	27.9	1.29	157
GTR316	10102	1198.	0.	0.	-1198.	292.	1459.	30.	119.	1.56	0.25	0.32	42.3	1.68	120.5	0	32.3	1.49	138
FCPADS	10102	698.	0.	0.	-698.	74.	729.	30.	30.	4.02	0.25	0.13	34.1	1.35	166.8	0	32.5	1.50	152
FCPADS	10102	2412.	0.	0.	-2412.	659.	2668.	30.	269.	28.02	0.25	0.28	154.0	6.11	217.9	0	86.2	3.99	161
FCMCDS	10102	663.	0.	0.	-663.	74.	729.	30.	30.	3.84	0.25	0.17	35.3	1.40	181.9	0	31.2	1.44	155
FCMCDS	10102	1760.	0.	0.	-1760	521.	2227.	30.	212.	21.00	0.25	0.36	132.4	5.25	256.7	0	64.0	2.96	150

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	20111	0.	33.	16.	0.	0.	0.	2.	0.	0.19	0.28	0.	1.6	1.00	189.2	0	0.7	1.00	80
STM141	20111	0.	36.	0.	0.	-3.	16.	2.	2.	0.36	0.28	0.26	3.2	2.02	299.4	0	1.0	1.34	156
STM141	20111	0.	37.	0.	0.	-3.	17.	2.	2.	0.29	0.28	0.28	3.0	1.93	280.5	0	0.9	1.23	145
STM141	20111	0.	0.	36.	0.	33.	-20. F	2.	2.	0.57	0.28	0.26	5.6	3.59	532.0	0	1.3	1.84	159
STM141	20111	0.	0.	37.	0.	33.	-19. F	2.	2.	0.46	0.28	0.28	5.2	3.30	480.0	0	1.2	1.61	145
STM141	20111	0.	0.	36.	0.	33.	-20. A	2.	2.	0.51	0.28	0.26	5.1	3.27	484.9	0	1.2	1.68	156
STM141	2011	0.	0.	37.	0.	33.	-19. A	2.	2.	0.40	0.28	0.28	4.6	2.94	427.7	0	1.0	1.44	143
STM088	20111	0.	36.	2.	0.	-3.	14.	2.	2.	0.28	0.28	0.23	2.6	1.65	252.9	0	0.8	1.17	140
STM088	20111	0.	1.	37.	0.	32.	-21. F	2.	2.	0.44	0.28	0.23	4.7	3.01	459.7	0	1.1	1.55	139
STM088	20111	0.	1.	37.	0.	32.	-21. A	2.	2.	0.38	0.28	0.23	4.3	2.75	420.4	0	1.0	1.41	137
PFBSTM	20111	0.	0.	36.	0.	33.	-20.	2.	2.	0.61	0.28	0.26	7.1	4.51	667.4	0	1.5	2.11	163
PFBSTM	20111	0.	0.	41.	0.	36.	-16.	2.	3.	0.47	0.28	0.33	6.8	4.36	571.9	0	1.3	1.84	152
TISTMT	20111	0.	36.	0.	0.	-3.	16.	2.	2.	0.53	0.28	0.26	8.7	5.54	818.2	0	1.7	2.39	167
TISTMT	20111	0.	44.	0.	0.	-7.	32.	2.	4.	0.56	0.28	0.37	13.0	8.32	999.8	0	2.2	3.03	177
TISTMT	20111	0.	0.	36.	0.	33.	-20.	2.	2.	0.79	0.28	0.26	12.2	7.80	1151.3	0	2.3	3.12	183
TISTMT	20111	0.	0.	44.	0.	38.	-12.	2.	4.	0.77	0.28	0.37	16.5	10.57	1270.2	0	2.7	3.65	191
TIHRSG	20111	0.	37.	4.	0.	-4.	12.	2.	1.	0.40	0.28	0.17	10.2	6.54	987.4	0	1.8	2.46	145
TIHRSG	20111	0.	1.	39.	0.	32.	-23.	2.	1.	0.57	0.28	0.17	13.2	8.44	1275.0	0	2.2	3.02	157
STIRL	20111	38.	0.	0.	-38.	33.	16.	2.	2.	0.34	0.28	0.21	2.7	1.71	236.9	0	1.0	1.34	153
STIRL	20111	53.	0.	0.	-53.	40.	39.	2.	5.	0.28	0.28	0.32	3.3	2.09	210.4	0	1.0	1.35	143
STIRL	20111	0.	38.	0.	0.	-5.	16.	2.	2.	0.34	0.28	0.21	2.7	1.71	237.1	0	0.9	1.25	151
STIRL	20111	0.	53.	0.	0.	-13.	39.	2.	5.	0.28	0.28	0.32	3.3	2.09	210.7	0	0.9	1.23	140
STIRL	20111	0.	0.	38.	0.	33.	-23.	2.	2.	0.57	0.28	0.21	5.7	3.66	508.2	0	1.3	1.85	153
STIRL	20111	0.	0.	53.	0.	40.	-14.	2	5.	0.45	0.28	0.32	5.8	3.74	376.6	0	1.2	1.61	140
HEGT85	20111	0.	0.	40.	0.	33.	-24. A	2.	2.	0.62	0.28	0.19	10.8	6.91	929.3	0	2.0	2.71	164
HEGT85	20111	0.	0.	64.	0.	43.	-15. A	2.	6.	0.65	0.28	0.31	17.8	11.37	950.8	0	2.7	3.66	174
HEGT60	20111	0.	0.	42.	0.	33.	-26. A	2.	2.	0.62	0.28	0.13	10.6	6.79	856.3	0	2.0	2.69	157
HEGT60	20111	0.	0.	63.	0.	40.	-24. A	2.	5.	0.59	0.28	0.20	15.2	9.70	820.3	0	2.4	3.26	157
HEGT00	20111	0.	0.	43.	0.	33.	-27. A	2.	2.	0.55	0.28	0.12	9.5	6.08	757.3	0	1.8	2.43	150
HEGT00	20111	0.	0.	46.	0.	34.	-27. A	2.	2.	0.42	0.28	0.14	9.6	6.13	707.5	0	1.6	2.26	137
FCMCCL	20111	0.	0.	38.	0.	33.	-22.	2.	2.	0.61	0.28	0.23	9.3	5.94	839.5	0	1.8	2.49	165
FCMCCL	20111	0.	0.	50.	0.	39.	-14.	2.	4.	0.54	0.28	0.34	11.7	7.50	793.8	0	1.9	2.66	162
FCSTCL	20111	0.	0.	37.	0.	33.	-21.	2.	2.	0.67	0.28	0.24	9.1	5.78	827.3	0	1.8	2.52	167
FCSTCL	20111	0.	0.	66.	0.	48.	-0.	2.	8.	0.73	0.28	0.42	15.2	9.70	790.3	0	2.4	3.32	173
IGGTST	20111	0.	0.	39.	0.	33.	-24.	2.	2.	0.73	0.28	0.19	9.5	6.07	822.4	0	2.0	2.69	166
IGGTST	20111	0.	0.	61.	0.	42.	-14.	2.	6.	0.71	0.28	0.31	13.2	8.45	738.0	0	2.3	3.11	164
GTSOAR	20111	0.	39.	0.	0.	-6.	16.	2.	2.	0.33	0.28	0.21	3.3	2.14	294.2	0	1.0	1.35	148
GTSOAR	20111	0.	53.	0.	0.	-14.	37.	2.	4.	0.26	0.28	0.31	4.0	2.56	259.4	0	1.0	1.33	137
GTAC08	20111	0.	38.	0.	0.	-5.	16.	2.	2.	0.32	0.28	0.22	2.9	1.88	264.4	0	0.9	1.26	150
GTAC08	20111	0.	47.	0.	0.	-10.	31.	2.	4.	0.23	0.28	0.31	3.1	2.01	227.1	0	0.8	1.15	141
GTAC12	20111	0.	38.	0.	0.	-5.	16.	2.	2.	0.32	0.28	0.23	3.0	1.89	266.6	0	0.9	1.26	150
GTAC12	20111	0.	51.	0.	0.	-11.	37.	2.	5.	0.25	0.28	0.34	3.5	2.21	232.0	0	0.9	1.20	141
GTAC16	20111	0.	38.	0.	0.	-5.	16.	2.	2.	0.32	0.28	0.23	3.0	1.95	274.5	0	0.9	1.28	150

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTAC16	20111	0.	53.	0.	0.	-13.	42.	2.	5.	0.26	0.28	0.35	3.8	2.45	244.5	0	0.9	1.27	140
GTWC16	20111	0.	39.	0.	0.	-6.	16.	2.	2.	0.33	0.28	0.20	3.3	2.10	285.3	0	1.0	1.34	147
GTWC16	20111	0.	60.	0.	0.	-18.	45.	2.	5.	0.28	0.28	0.31	4.3	2.75	247.4	0	1.0	1.40	134
CC1626	20111	0.	39.	0.	0.	-6.	16.	2.	2.	0.40	0.28	0.20	3.4	2.18	297.3	0	1.1	1.47	149
CC1626	20111	0.	84.	0.	0.	-31.	81.	2.	10.	0.44	0.28	0.37	6.3	4.04	257.1	0	1.4	1.89	134
CC1622	20111	0.	39.	0.	0.	-6.	16.	2.	2.	0.39	0.28	0.21	3.2	2.06	284.4	0	1.0	1.43	151
CC1622	20111	0.	76.	0.	0.	-26.	73.	2.	9.	0.41	0.28	0.38	5.6	3.60	252.4	0	1.3	1.74	135
CC1222	20111	0.	39.	0.	0.	-6.	16.	2.	2.	0.39	0.28	0.21	3.1	2.0[illegible]	277.8	0	1.0	1.41	151
CC1222	20111	0.	76.	0.	0.	-26.	73.	2.	9.	0.41	0.28	0.38	5.4	3.45	243.3	0	1.2	1.70	135
CC0822	20111	0.	38.	0.	0.	-5.	16.	2.	2.	0.39	0.28	0.22	3.3	2.09	294.4	0	1.0	1.42	152
CC0822	20111	0.	64.	0.	0.	-18.	59.	2.	7.	0.38	0.28	0.39	4.9	3.13	261.3	0	1.1	1.58	139
STIG15	20111	0.	45.	0.	0.	-12.	16.	2.	2.	0.35	0.28	0.07	3.5	2.23	262.4	0	1.1	1.46	133
STIG15	20111	0.	1846.	0.	0.	-1312.	1693.	2.	206.	2.64	0.28	0.17	65.0	41.49	120.1	0	13.7	18.83	508
STIG10	20111	0.	44.	0.	0.	-11.	16.	2.	2.	0.34	0.28	0.10	3.3	2.12	258.3	0	1.0	1.41	137
STIG10	20111	0.	181.	0.	0.	-106.	157.	2.	19.	0.50	0.28	0.22	8.9	5.70	168.0	0	2.0	2.75	122
STIGIS	20111	0.	43.	0	0.	-10.	16.	2.	2.	0.34	0.28	0.12	3.2	2.07	257.1	0	1.0	1.39	138
STIGIS	20111	0.	114.	0.	0.	-58.	92.	2.	11.	0.39	0.28	0.23	6.1	3.93	184.3	0	1.5	2.00	116
DEADV3	20111	0.	39.	0.	0.	-6.	16.	2.	2.	0.38	0.28	0.20	4.4	2.82	385.1	0	1.1	1.57	148
DEADV3	20111	0.	72.	0.	0.	-25.	64.	2.	8.	0.40	0.28	0.36	7.1	4.52	335.1	0	1.4	1.93	137
DEHTPM	20111	0.	37.	0.	0.	-4.	16.	2.	2.	0.40	0.28	0.24	4.3	2.78	400.9	0	1.1	1.56	153
DEHTPM	20111	0.	55.	0.	0.	-12.	48.	2.	6.	0.38	0.28	0.40	6.0	3.82	374.1	0	1.2	1.79	146
DESOA3	20111	40.	0.	0.	-40.	33.	16.	2.	2.	0.35	0.28	0.19	3.3	2.11	284.1	0	1.1	1.48	149
DESOA3	20111	76.	0.	0.	-76.	48.	66.	2.	8.	0.40	0.28	0.33	7.2	4.57	322.0	0	1.6	2.16	139
DESOA3	20111	0.	40.	0.	0.	-7.	16.	2.	2.	0.35	0.28	0.19	3.3	2.11	284.1	0	1.0	1.38	147
DESOA3	20111	0.	76.	0.	0.	-28.	66.	2.	8.	0.40	0.28	0.33	7.2	4.57	322.0	0	1.4	1.98	135
GTSOAD	20111	38.	0.	0.	-38.	33.	16.	2.	2.	0.32	0.28	0.22	2.9	1.83	256.2	0	1.0	1.34	152
GTSOAD	20111	50.	0.	0.	-50.	39.	35.	2.	4.	0.24	0.28	0.32	3.2	2.03	214.9	0	0.9	1.28	143
GTRA08	20111	39.	0.	0.	-39.	33.	16.	2.	2.	0.33	0.28	0.21	3.5	2.25	311.5	0	1.1	1.47	150
GTRA08	20111	64.	0.	0.	-64.	45.	55.	2.	7.	0.30	0.28	0.36	5.2	3.34	279.7	0	1.2	1.68	139
GTRA12	20111	38.	0.	0.	-38.	33.	16.	2.	2.	0.33	0.28	0.21	3.4	2.19	304.3	0	1.1	1.45	151
GTRA12	20111	63.	0.	0.	-63.	44.	54.	2.	7.	0.30	0.28	0.36	5.1	3.23	278.4	0	1.2	1.66	140
GTRA16	20111	38.	0.	0.	-38.	33.	16.	2.	2.	0.33	0.28	0.21	3.5	2.26	314.1	0	1.1	1.47	151
GTRA16	20111	61.	0.	0.	-61.	44.	51.	2.	6.	0.30	0.28	0.36	5.2	3.34	292.6	0	1.2	1.67	141
GTR208	20111	38.	0.	0.	-38.	33.	16.	2.	2.	0.33	0.28	0.21	3.3	2.09	290.4	0	1.0	1.42	151
GTR208	20111	56.	0.	0.	-56.	41.	43.	2.	5.	0.27	0.28	0.34	4.2	2.69	256.3	0	1.1	1.48	141
GTR212	20111	39.	0.	0.	-39.	33.	16.	2.	2.	0.33	0.28	0.21	3.4	2.14	296.8	0	1.0	1.44	151
GTR212	20111	58.	0.	0.	-58.	42.	46.	2.	6.	0.28	0.28	0.34	4.5	2.90	265.2	0	1.1	1.55	140
GTR216	20111	38.	0.	0.	-38.	33.	16.	2.	2.	0.33	0.28	0.22	3.4	2.17	301.6	0	1.0	1.44	151
GTR216	20111	58.	0.	0.	-58.	42.	47.	2.	6.	0.29	0.28	0.35	4.7	3.01	275.3		1.1	1.57	141
GTRW08	20111	40.	0.	0.	-40.	33.	16.	2.	2.	0.34	0.28	0.18	3.6	2.30	304.7		1.1	1.51	147
GTRW08	20111	78.	0.	0.	-78.	48.	66.	2.	8.	0.34	0.28	0.31	5.9	3.78	258.9		1.4	1.92	133
GTRW12	20111	40.	0.	0.	-40.	33.	16.	2.	2.	0.34	0.28	0.19	3.6	2.29	308.0	0	1.1	1.50	148
GTRW12	20111	78.	0.	0.	-78.	49.	68.	2.	8.	0.34	0.28	0.33	6.0	3.84	264.4	0	1.4	1.91	134
GTRW16	20111	40.	0.	0.	-40.	33.	16.	2.	2.	0.34	0.28	0.19	3.7	2.35	316.5	0	1.1	1.52	148

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																
		COGENERATION CASE			**NOCOGEN - COGEN**													
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTRW16	20111	74.	0.	0.	-74.	47.	64.	2.	8.	0.34	0.28	0.33	6.0	3.86	277.2	0	1.4	1.90	136
GTR308	20111	41.	0.	0.	-41.	33.	16.	2.	2.	0.33	0.28	0.17	3.3	2.13	280.6	0	1.1	1.46	146
GTR308	20111	66.	0.	0.	-66.	43.	50.	2.	6.	0.29	0.28	0.28	4.6	2.96	238.1	0	1.2	1.66	134
GTR312	20111	40.	0.	0.	-40.	33.	16.	2.	2.	0.33	0.28	0.19	3.4	2.19	295.2	0	1.1	' 47	148
GTR312	20111	69.	0.	0.	-69.	45.	57	2.	7.	0.31	0.28	0.32	5.1	3.26	251.9	0	1.3	1.72	135
GTR316	20111	40.	0.	0.	-40.	33.	16.	2.	2.	0.34	0.28	0.19	3.5	2.26	304.3	0	1.1	1.49	148
GTR316	20111	69.	0.	0.	-69.	45.	56.	2.	7.	0.31	0.28	0.32	5.3	3.39	263.7	0	1.3	1.76	136
FCPADS	20111	40.	0.	0.	-40.	33.	16.	2.	2.	0.32	0.28	0.19	3.0	1.92	258.7	0	1.0	1.38	149
FCPADS	20111	81.	0.	0.	-81.	50.	74.	2.	9.	0.46	0.28	0.35	6.0	3.80	249.6	0	1.5	2.06	138
FCMCDS	20111	40.	0.	0.	-40.	33.	16.	2.	2.	0.32	0.28	0.18	3.2	2.03	271.7	0	1.0	1.41	148
FCMCDS	20111	103.	0.	0.	-103.	59.	102.	2.	12.	0.59	0.28	0.36	8.8	5.60	290.4	0	2.0	2.71	144

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	20261	0.	16.	11.	0.	0.	0.		1.	0.	0.14	0.41	0.	1.0	1.00	252.1	0	0.4	1.00	80
STM141	20261	0.	18.	3.	0.	-2.	8.		1.	1.	0.22	0.41	0.24	1.9	1.96	380.5	0	0.6	1.29	141
STM141	20261	0.	1.	20.	0.	15.	-9.	F	1.	1.	0.34	0.41	0.24	3.0	3.19	617.6	0	0.8	1.72	143
STM141	20261	0.	1.	20.	0.	15.	-9.	A	1.	1.	0.29	0.41	0.24	2.9	3.05	591.4	0	0.7	1.59	140
STM088	20261	0.	17.	4.	0.	-1.	6.		1.	1.	0.21	0.41	0.19	1.6	1.65	337.1	0	0.5	1.22	134
STM088	20261	0.	1.	20.	0.	15.	-10.	F	1.	1.	0.33	0.41	0.19	2.8	2.89	587.9	0	0.7	1.65	135
STM088	20261	0.	1.	20.	0.	15.	-10.	A	1.	1.	0.28	0.41	0.19	2.7	2.84	579.6	0	0.7	1.55	133
PFBSTM	20261	0.	0.	18.	0.	16.	-8.		1.	1.	0.42	0.41	0.32	4.4	4.64	828.0	0	1.0	2.19	172
PFBSTM	20261	0.	0.	19.	0.	16.	-7.		1.	1.	0.34	0.41	0.33	4.2	4.41	771.0	0	0.9	1.95	157
TISTMT	20261	0.	18.	0.	0.	-2.	11.		1.	1.	0.40	0.41	0.32	6.2	6.53	1162.5	0	1.2	2.72	181
TISTMT	20261	0.	20.	0.	0.	-3.	15.		1.	2.	0.37	0.41	0.37	7.4	7.74	1239.7	0	1.3	2.91	179
TISTMT	20261	0.	0.	18.	0.	16.	-8.		1.	1.	0.59	0.41	0.32	8.4	8.78	1563.5	0	1.6	3.52	199
TISTMT	20261	0.	0.	20.	0.	17.	-6.		1.	2.	0.51	0.41	0.37	9.4	9.82	1573.6	0	1.6	3.56	194
TIHRSG	20261	0.	18.	5.	0.	-2.	5.		1.	1.	0.25	0.41	0.14	5.8	6.07	1221.6	0	1.0	2.33	136
TIHRSG	20261	0.	2.	21.	0.	15.	-11.		1.	1.	0.37	0.41	0.14	7.5	7.83	1576.7	0	1.3	2.91	149
STIRL	20261	20.	0.	0.	-20.	16.	11.		1.	1.	0.25	0.41	0.27	1.6	1.68	278.1	0	0.6	1.35	160
STIRL	20261	24.	0.	0.	-24.	18.	18.		1.	2.	0.19	0.41	0.33	1.6	1.67	224.0	0	0.5	1.21	151
STIRL	20261	0.	20.	0.	0.	-4.	11.		1.	1.	0.25	0.41	0.27	1.6	1.68	278.2	0	0.6	1.28	158
STIRL	20261	0.	24.	0.	0.	-6.	18.		1.	2.	0.19	0.41	0.33	1.6	1.67	224.2	0	0.5	1.11	149
STIRL	20261	0.	0.	20.	0.	16.	-9.		1.	1.	0.42	0.41	0.27	3.5	3.65	603.8	0	0.9	1.95	162
STIRL	20261	0.	0.	24.	0.	18.	-6.		1.	2.	0.31	0.41	0.33	3.2	3.32	446.0	0	0.7	1.58	148
HEGT85	20261	0.	0.	20.	0.	16.	-10.	A	1.	1.	0.45	0.41	0.25	7.5	7.80	1256.3	0	1.4	3.02	179
HEGT85	20261	0.	0.	27.	0.	19.	-6.	A	1.	3.	0.39	0.41	0.32	9.8	10.22	1221.1	0	1.5	3.38	179
HEGT60	20261	0.	0.	22.	0.	16.	-12.	A	1.	1.	0.45	0.41	0.16	7.3	7.67	1113.1	0	1.3	3.01	168
HEGT60	20261	0.	0.	29.	0.	18.	-11.	A	1.	2.	0.37	0.41	0.20	8.8	9.19	1035.4	0	1.4	3.15	162
HEGT00	20261	0.	1.	23.	0.	16.	-12.	A	1.	1.	0.27	0.41	0.13	5.5	5.80	891.9	0	1.0	2.20	134
FCMCCL	20261	0.	0.	19.	0.	16.	-9.		1.	1.	0.44	0.41	0.28	6.2	6.50	1092.1	0	1.2	2.72	176
FCMCCL	20261	0.	0.	23.	0.	18.	-6.		1.	2.	0.35	0.41	0.34	6.8	7.13	1006.6	0	1.2	2.62	167
FCSTCL	20261	0.	0.	19.	0.	16.	-8.		1.	1.	0.51	0.41	0.29	6.1	6.42	1096.8	0	1.3	2.84	181
FCSTCL	20261	0.	0.	30.	0.	22.	-0.		1.	4.	0.48	0.41	0.42	8.8	9.22	1000.7	0	1.5	3.32	183
IGGTST	20261	0.	0.	21.	0.	16.	-10.		1.	1.	0.56	0.41	0.24	6.6	6.88	1094.1	0	1.4	3.09	180
IGGTST	20261	0.	0.	28.	0.	19.	-7.		1.	3.	0.50	0.41	0.31	8.0	8.33	970.2	0	1.4	3.23	175
GTSOAR	20261	0.	20.	0.	0.	-4.	11.		1.	1.	0.24	0.41	0.25	2.2	2.33	377.6	0	0.6	1.42	154
GTSOAR	20261	0.	24.	0.	0.	-6.	17.		1.	2.	0.18	0.41	0.31	2.3	2.46	331.6	0	0.6	1.29	143
GTAC08	20261	0.	20.	0.	0.	-3.	11.		1.	1.	0.23	0.41	0.27	1.9	1.96	325.8	0	0.6	1.29	156
GTAC08	20261	0.	22.	0.	0.	-4.	14.		1.	2.	0.16	0.41	0.31	1.8	1.89	285.6	0	0.5	1.12	145
GTAC12	20261	0.	19.	0.	0.	-3.	11.		1.	1.	0.24	0.41	0.28	1.9	1.99	333.9	0	0.6	1.31	157
GTAC12	20261	0.	23.	0.	0.	-5.	17.		1.	2.	0.17	0.41	0.34	2.0	2.05	287.1	0	0.5	1.16	147
GTAC16	20261	0.	19.	0.	0.	-3.	11.		1.	1.	0.24	0.41	0.28	2.0	2.07	347.1	0	0.6	1.34	157
GTAC16	20261	0.	25.	0.	0.	-6.	19.		1.	2.	0.18	0.41	0.35	2.2	2.26	300.6	0	0.5	1.22	147
GTWC16	20261	0.	20.	0.	0.	-4.	11.		1.	1.	0.25	0.41	0.24	2.2	2.29	365.9	0	0.6	1.42	153
GTWC16	20261	0.	27.	0.	0.	-8.	21.		1.	3.	0.19	0.41	0.31	2.5	2.62	313.5	0	0.6	1.35	142
CC1626	20261	0.	20.	0.	0.	-4.	11.		1.	1.	0.32	0.41	0.24	2.3	2.43	390.5	0	0.7	1.62	157

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
CC1626	20261	0.	38.	0.	0.	-14.	37.	1.	5.	0.31	0.41	0.37	3.7	3.84	325.9	0	0.8	1.90	144
CC1622	20261	0.	20.	0.	0.	-4.	11.	1.	1.	0.31	0.41	0.26	2.2	2.27	369.9	0	0.7	1.56	158
CC1622	20261	0.	35.	0.	0.	-12.	33.	1.	4.	0.30	0.41	0.38	3.2	3.35	312.4	0	0.8	1.73	146
CC1222	20261	0.	20.	0.	0.	-4.	11.	1.	1.	0.31	0.41	0.26	[illegible]	2.20	359.9	0	0.7	1.54	159
CC1222	20261	0.	35.	0.	0.	-12.	33.	1.	4.	0.29	0.41	0.38	3.1	3.21	301.2	0	0.8	1.69	146
CC0822	20261	0.	19.	0.	0.	-3.	11.	1.	1.	0.31	0.41	0.28	2.2	2.31	386.9	0	0.7	1.56	160
CC0822	20261	0.	29.	0.	0.	-8.	27.	1.	3.	0.28	0.41	0.39	2.9	2.99	332.3	0	0.7	1.60	150
STIG15	20261	0.	24.	0.	0.	-8.	11.	1.	1.	0.28	0.41	0.09	2.4	2.54	338.6	0	0.7	1.61	137
STIG15	20261	0.	846.	0.	0.	-601.	776.	1.	94.	1.38	0.41	0.17	29.4	30.76	118.6	0	6.4	14.38	397
STIG10	20261	0.	23.	0.	0.	-7.	11.	1.	1.	0.27	0.41	0.13	2.3	2.39	332.3	0	0.7	1.54	141
STIG10	20261	0.	83.	0.	0.	-49.	72.	1.	9.	0.33	0.41	0.22	5.1	5.37	211.0	0	1.1	2.57	123
STIG1S	20261	0.	23.	0.	0.	-7.	11.	1.	1.	0.26	0.41	0.15	2.2	2.32	329.8	0	0.7	1.51	143
STIG1S	20261	0.	52.	0.	0.	-27.	42.	1.	5.	0.26	0.41	0.23	3.6	3.74	233.8	0	0.9	1.90	124
DEADV3	20261	0.	20.	0.	0.	-4.	11.	1.	1.	0.29	0.41	0.26	3.1	3.22	525.7	0	0.8	1.72	157
DEADV3	20261	0.	31.	0.	0.	-10.	28.	1.	3.	0.27	0.41	0.37	4.2	4.38	459.0	0	0.8	1.89	149
DEHTPM	20261	0.	19.	0.	0.	-3.	11.	1.	1.	0.31	0.41	0.30	3.0	3.17	548.2	0	0.8	1.72	162
DEHTPM	20261	0.	25.	0.	0.	-6.	22.	1.	3.	0.27	0.41	0.40	3.7	3.85	502.1	0	0.8	1.74	156
DESOA3	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.27	0.41	0.24	2.0	2.13	341.0	0	0.7	1.50	156
DESOA3	20261	32.	0.	0.	-32.	21.	28.	1.	3.	0.24	0.41	0.35	3.2	3.31	335.3	0	0.8	1.74	146
DESOA3	20261	0.	20.	0.	0	4.	11.	1.	1.	0.27	0.41	0.24	2.0	2.13	341.0	0	0.6	1.43	154
DESOA3	20261	0.	32.	0.	0.	1.	28.	1.	3.	0.24	0.41	0.35	3.2	3.31	335.3	0	0.7	1.61	143
GTSOAD	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.23	0.41	0.27	1.8	1.92	318.5	0	0.6	1.37	158
GTSOAD	20261	23.	0.	0.	-23.	18.	16.	1.	2.	0.17	0.41	0.32	1.8	1.91	269.7	0	0.5	1.22	148
GTRA08	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.26	0.41	0.26	2.4	2.51	411.0	0	0.7	1.55	157
GTRA08	20261	29.	0.	0.	-29.	20.	25.	1.	3.	0.21	0.41	0.36	3.1	3.19	356.9	0	0.7	1.61	147
GTRA12	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.25	0.41	0.26	2.3	2.41	397.0	0	0.7	1.53	157
GTRA12	20261	29.	0.	0.	-29.	20.	25.	1.	3.	0.20	0.41	0.36	3.0	3.09	348.7	0	0.7	1.57	148
GTRA16	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.25	0.41	0.26	2.4	2.50	410.8	0	0.7	1.55	157
GTRA16	20261	28.	0.	0.	-28.	20.	23.	1.	3.	0.20	0.41	0.36	3.0	3.14	366.8	0	0.7	1.59	148
GTR208	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.25	0.41	0.26	2.2	2.28	374.5	0	0.7	1.48	157
GTR208	20261	26.	0.	0.	-26.	19.	20.	1.	2.	0.19	0.41	0.34	2.4	2.55	324.5	0	0.6	1.41	147
GTR212	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.25	0.41	0.26	2.2	2.35	384.6	0	0.7	1.51	157
GTR212	20261	27.	0.	0.	-27.	19.	21.	1.	3.	0.19	0.41	0.34	2.6	2.75	334.9	0	0.7	1.47	147
GTR216	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.25	0.41	0.26	2.3	2.38	391.5	0	0.7	1.51	157
GTR216	20261	27.	0.	0.	-27.	19.	22.	1.	3.	0.20	0.41	0.35	2.7	2.83	345.0	0	0.7	1.49	148
GTRW08	20261	21.	0.	0.	-21.	16.	11.	1.	1.	0.26	0.41	0.22	2.5	2.58	399.3	0	0.7	1.61	152
GTRW08	20261	36.	0.	0.	-36.	22.	30.	1.	4.	0.23	0.41	0.31	3.5	3.64	332.3	0	0.8	1.83	141
GTRW12	20261	21.	0.	0.	-21.	16.	11.	1.	1.	0.26	0.41	0.23	2.5	2.58	405.1	0	0.7	1.60	154
GTRW12	20261	36.	0.	0.	-36.	22.	31.	1.	4.	0.23	0.41	0.33	3.5	3.70	339.3	0	0.8	1.83	143
GTRW16	20261	21.	0.	0.	-21.	16.	11.	1.	1.	0.26	0.41	0.23	2.5	2.65	417.4	0	0.7	1.62	154
GTRW16	20261	34.	0.	0.	-34.	22.	29.	1.	4.	0.23	0.41	0.33	3.6	3.72	356.1	0	0.8	1.82	144
GTR308	20261	21.	0.	0.	-21.	16.	11.	1.	1.	0.25	0.41	0.21	2.2	2.33	358.5	0	0.7	1.54	151
GTR308	20261	30.	0.	0.	-30.	20.	23.	1.	3.	0.20	0.41	0.28	2.7	2.81	301.2	0	0.7	1.56	141
GTR312	20261	21.	0.	0.	-21.	16.	11.	1.	1.	0.26	0.41	0.23	2.3	2.44	384.7	0	0.7	1.56	154

GENERAL ELECTRIC COMPANY
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REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL												
GTR312	20261	32.	0.	0.	-32.	21.	26.	1.	3.	0.21	0.41	0.32	3.0	3.14	322.7	0	0.7	1.64	143
GTR316	20261	21.	0.	0.	-21.	16.	11.	1.	1.	0.26	0.41	0.23	2.4	2.53	398.0	0	0.7	1.58	154
GTR316	20261	32.	0.	0.	-32.	21.	26.	1.	3.	0.2[illegible]	0.41	0.32	3.1	3.27	338.4	0	0.8	1.68	143
FCPADS	20261	20.	0.	0.	-20.	16.	11.	1.	1.	0.23	0.41	0.25	1.8	1.93	312.7	0	0.6	1.37	156
FCPADS	20261	34.	0.	0.	-34.	22.	31.	1.	4.	0.23	0.41	0.36	2.7	2.83	274.8	0	0.7	1.58	145
FCMCDS	20261	21.	0.	0.	-21.	16.	11.	1.	1.	0.23	0.41	0.23	2.0	2.10	329.3	0	0.6	1.43	153
FCMCDS	20261	47.	0.	0.	-47.	27.	47.	1.	6.	0.31	0.41	0.36	4.2	4.43	306.0	0	1.0	2.20	143

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6 **COGENERATION CASE**			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DIST	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONCCON	20461	0.	70.	1009.	0.	0.	0.	F	29.	0.	2.16	0.15	0.	42.8	1.00	188.6	0	24.8	1.00	80
STM141	20461	0.	890.	0.	0.	-820.	1009.		29.	29.	1.57	0.15	0.18	29.6	0.69	113.3	-11	26.1	1.05	163
STM141	20461	0.	1008.	0.	0.	-866.	1252.		29.	58.	1.29	0.15	0.28	28.1	0.66	95.0	999	24.0	0.97	158
STM141	20461	0.	0.	890.	0.	70.	120.	F	29.	29.	3.04	0.15	0.18	51.9	1.21	199.0	27	21.1	0.85	144
STM141	20461	0.	0.	1008.	0.	142.	244.	F	29.	58.	2.90	0.15	0.28	59.0	1.38	199.7	25	18.8	0.76	134
STM141	20461	0.	0.	890.	0.	70.	120.	A	29.	29.	2.83	0.15	0.18	43.4	1.01	166.6	999	19.9	0.80	147
STM141	20461	0.	0.	1008.	0.	142.	244.	A	29.	58.	2.57	0.15	0.28	41.8	0.98	141.4	999	16.6	0.67	140
STM088	20461	0.	890.	0.	0.	-820.	1009.		29.	29.	1.44	0.15	0.18	24.9	0.58	95.5	-7	25.5	1.03	167
STM088	20461	0.	959.	0.	0.	-847.	1152.		29.	46.	1.23	0.15	0.24	25.8	0.60	91.8	-2	24.4	0.98	160
STM088	20461	0.	0.	890.	0.	70.	120.	F	29.	29.	2.98	0.15	0.18	51.1	1.19	196.0	30	20.9	0.84	144
STM088	20461	0.	0.	959.	0.	112.	192.	F	29.	46.	2.73	0.15	0.24	55.5	1.30	197.4	28	19.5	0.78	135
STM088	20461	0.	0.	890.	0.	70.	120.	A	29.	29.	2.80	0.15	0.18	42.0	0.98	161.1	999	19.8	0.80	147
STM088	20461	0.	0.	959.	0.	112.	192.	A	29.	46.	2.49	0.15	0.24	40.5	0.95	144.1	999	17.6	0.71	141
PFBSTM	20461	0.	0.	891.	0.	70.	118.		29.	29.	3.40	0.15	0.17	52.3	1.22	200.4	24	21.5	0.87	144
PFBSTM	20461	0.	0.	1118.	0.	207.	349.		29.	84.	4.23	0.15	0.33	58.6	1.37	178.7	29	17.7	0.71	132
TISTMT	20461	0.	892.	0.	0.	-822.	1009.		29.	29.	2.56	0.15	0.17	69.3	1.62	265.1	0	31.5	1.27	147
TISTMT	20461	0.	1220.	0.	0.	-955.	1665.		29.	108.	4.45	0.15	0.37	150.9	3.52	422.0	0	37.9	1.53	133
TISTMT	20461	0.	0.	892.	0.	70.	117.		29.	29.	4.09	0.15	0.17	95.5	2.23	365.0	1	26.9	1.08	136
TISTMT	20461	0.	0.	1220.	0.	266.	445.		29.	108.	6.28	0.15	0.37	189.7	4.43	530.4	0	31.6	1.27	124
TIHRSG	20461	0.	915.	0.	0.	-845.	1009.		29.	29.	3.14	0.15	0.15	97.4	2.27	363.2	0	35.4	1.42	142
TIHRSG	20461	0.	971.	0.	0.	-873.	1104.		29.	40.	3.46	0.15	0.19	119.8	2.80	420.7	0	37.7	1.52	134
TIHRSG	20461	0.	0.	915.	0.	70.	95.		29.	29.	4.89	0.15	0.15	132.0	3.08	492.3	0	31.9	1.28	133
TIHRSG	20461	0.	0.	971.	0.	98.	133.		29.	40.	5.05	0.15	0.19	152.7	3.56	536.4	0	33.3	1.34	126
STIRL	20461	940.	0.	0.	-940.	70.	1009.		29.	29.	1.74	0.15	0.13	38.3	0.89	139.2	-79	33.5	1.35	158
STIRL	20461	1457.	0.	0.	-1457.	290	1745.		29.	118.	2.54	0.15	0.28	75.9	1.77	177.8	0	39.8	1.60	134
STIRL	20461	0.	940.	0.	0.	-870.	1009.		29.	29.	1.74	0.15	0.13	38.4	0.90	139.3	-38	28.4	1.14	153
STIRL	20461	0.	1457.	0.	0.	-1168.	1745.		29.	118.	2.55	0.15	0.28	76.0	1.77	178.1	0	31.9	1.28	126
STIRL	20461	0.	0.	940.	0.	70.	69.		29.	29.	3.30	0.15	0.13	64.4	1.50	233.9	10	23.2	0.93	135
STIRL	20461	0.	0.	1457.	0.	290.	287.		29.	118.	5.05	0.15	0.28	134.1	3.13	314.1	4	25.9	1.04	110
HEGT85	20461	0.	0.	981.	0.	70.	28.	A	29.	29.	3.61	0.15	0.09	81.5	1.90	283.5	2	26.1	1.05	128
HEGT85	20461	0.	0.	2424.	0.	559.	224.	A	29.	228.	8.42	0.15	0.24	233.6	5.45	328.7	0	37.1	1.49	96
HEGT60	20461	0.	0.	983.	0.	70.	26.	A	29.	29.	3.58	0.15	0.09	79.3	1.85	275.2	2	25.9	1.04	128
HEGT60	20461	0.	0.	1734.	0.	323.	122.	A	29.	132.	5.89	0.15	0.20	156.6	3.66	308.2	0	31.3	1.26	101
HEGT00	20461	0.	0.	991.	0.	70.	19.	A	29.	29.	3.55	0.15	0.08	76.3	1.78	262.7	3	25.6	1.03	128
HEGT00	20461	0.	0.	1271.	0.	161.	43.	A	29.	66.	4.03	0.15	0.14	99.5	2.32	267.3	1	26.9	1.08	112
FCMCCL	20461	0.	0.	916.	0.	70.	93.		29.	29.	3.85	0.15	0.15	75.2	1.75	280.0	5	25.0	1.00	136
FCMCCL	20461	0.	0	1586.	0.	303.	403.		29.	123.	6.56	0.15	0.34	125.4	2.93	308.9	4	25.3	1.02	116
FCSTCL	20461	0.	0	909.	0.	70.	100.		29.	29.	3.74	0.15	0.16	72.3	1.69	271.1	6	24.4	0.98	137
FCSTCL	20461	0.	0.	1800.	0.	534.	764.		29.	218.	8.55	0.15	0.42	163.2	3.81	309.4	6	22.9	0.92	109
IGGTST	20461	0.	0.	940.	0.	70.	69.		29.	29.	3.31	0.15	0.13	69.0	1.61	250.3	7	24.1	0.97	134
IGGTST	20461	0.	0.	1679.	0.	383.	379.		29.	156.	4.25	0.15	0.31	128.9	3.01	262.1	7	22.5	0.90	104
GTSOAR	20461	0.	931.	0.	0.	-861.	1009.		29.	29.	1.52	0.15	0.14	32.2	0.75	118.0	-18	27.3	1.10	157
GTSOAR	20461	0.	1449.	0.	0.	-1147.	1786.		29.	123.	1.82	0.15	0.31	51.5	1.20	121.3	0	27.6	1.11	132

		----------FUEL USE IN BTU*10**6----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTAC08	20461	0.	920.	0.	0.	-850.	1009.	29.	29.	1.48	0.15	0.15	30.4	0.71	112.9	-14	26.8	1.08	160
GTAC08	20461	0.	1296.	0.	0.	-1044.	1617.	29.	103.	1.50	0.15	0.31	39.2	0.92	103.3	-13	25.5	1.02	142
GTAC12	20461	0.	917.	0.	0.	-847.	1009.	29.	29.	1.49	0.15	0.15	31.0	0.72	115.5	-15	26.8	1.08	159
GTAC12	20461	0.	1395.	0.	0.	-1089.	1799.	29.	125.	1.68	0.15	0.34	46.2	1.08	113.1	0	25.4	1.02	136
GTAC16	20461	0.	917.	0.	0.	-847.	1009.	29.	29.	1.50	0.15	0.15	31.8	0.74	118.4	-16	26.9	1.08	159
GTAC16	20461	0.	1468.	0.	0.	-1127.	1916.	29.	139.	1.93	0.15	0.35	55.7	1.30	129.5	0	26.2	1.06	131
GTWC16	20461	0.	938.	0.	0.	-868.	1009.	29.	29.	1.51	0.15	0.13	31.7	0.74	115.5	-18	27.4	1.10	157
GTWC16	20461	0.	1634.	0.	0.	-1264.	2014.	29.	151.	1.80	0.15	0.31	49.6	1.16	103.6	0	27.6	1.11	129
CC1626	20461	0.	936.	0.	0.	-865.	1009.	29.	29.	1.61	0.15	0.13	32.0	0.75	116.6	-19	27.5	1.11	157
CC1626	20461	0.	2302.	0.	0.	-1638.	2999.	29.	271.	2.76	0.15	0.37	78.3	1.83	116.1	0	29.6	1.19	119
CC1622	20461	0.	929.	0.	0.	-859.	1009.	29.	29.	1.60	0.15	0.14	31.9	0.74	117.2	-18	27.4	1.10	158
CC1622	20461	0.	2095.	0.	0.	-1496.	2781.	29.	244.	2.71	0.15	0.38	79.2	1.85	129.0	0	28.7	1.16	120
CC1222	20461	0.	928.	0.	0.	-858.	1009.	29.	29.	1.59	0.15	0.14	31.3	0.73	115.1	-17	27.3	1.10	158
CC1222	20461	0.	2082.	0.	0.	-1484.	2779.	29.	244.	2.63	0.15	0.38	74.2	1.73	121.7	0	27.8	1.12	121
CC0822	20461	0.	918.	0.	0.	-848.	1009.	29.	29.	1.59	0.15	0.15	31.2	0.73	115.9	-16	27.0	1.09	159
CC0822	20461	0.	1759.	0.	0.	-1276.	2394.	29.	197.	2.26	0.15	0.39	61.2	1.43	118.7	2	25.4	1.02	126
STIG15	20461	0.	1027.	0.	0.	-957.	1009.	29.	29.	1.79	0.15	0.05	35.4	0.83	117.6	-38	30.2	1.22	147
STIG15	20461	0.	50692.	0.	0.	-36811.	47249.	29.	5661.	73.68	0.15	0.17	1371.1	32.00	92.3	0	577.1	23.23	619
STIG10	20461	0.	1004.	0.	0.	-934.	1009.	29.	29.	1.71	0.15	0.07	34.4	0.80	117.0	-31	29.4	1.19	149
STIG10	20461	0.	4974.	0.	0.	-3690.	5073.	29.	523.	6.80	0.15	0.22	145.3	3.39	99.7	0	66.1	2.66	125
STIG1S	20461	0.	993.	0.	0.	-924.	1009.	29.	29.	1.63	0.15	0.08	30.7	0.72	105.6	-22	28.7	1.16	153
STIG1S	20461	0.	3126.	0.	0.	-2373.	3297.	29.	307.	4.45	0.15	0.23	91.2	2.13	99.6	0	46.7	1.88	115
DEADV3	20461	0.	959.	0.	0.	-889.	1009.	29.	29.	1.79	0.15	0.11	41.0	0.96	145.9	-77	29.2	1.17	149
DEADV3	20461	0.	2594.	0.	0.	-1902.	3091.	29.	282.	5.36	0.15	0.31	182.6	4.26	240.2	0	48.3	1.94	117
DEHTPM	20461	0.	904.	0.	0.	-834.	1009.	29.	29.	1.82	0.15	0.16	40.3	0.94	152.0	-46	27.8	1.12	155
DEHTPM	20461	0	1499.	0.	0.	-1106.	2092.	29.	160.	3.45	0.15	0.40	107.7	2.51	245.1	0	30.7	1.24	125
DESOA3	20461	975.	0.	0.	-975.	70.	1009.	29.	29.	1.91	0.15	0.10	45.7	1.07	159.8	0	35.4	1.43	151
DESOA3	20461	2995.	0.	0.	-2995.	777.	3377.	29.	317.	7.19	0.15	0.28	254.2	5.93	289.6	0	78.2	3.15	139
DESOA3	20461	0.	975.	0.	0.	-905.	1009.	29.	29.	1.91	0.15	0.10	45.7	1.07	159.8	0	30.1	1.21	146
DESOA3	20461	0.	2995.	0.	0.	-2218.	3377.	29.	317.	7.19	0.15	0.28	254.2	5.93	289.6	0	62.0	2.50	123
GTSOAD	20461	922.	0.	0.	-922.	70.	1009.	29.	29.	1.46	0.15	0.15	29.8	0.70	110.3	-31	31.7	1.28	165
GTSOAD	20461	1384.	0.	0.	-1384.	290.	1748.	29.	116.	1.53	0.15	0.32	40.1	0.94	99.0	104	32.8	1.32	146
GTRA08	20461	927.	0.	0.	-927.	70.	1009.	29.	29.	1.53	0.15	0.14	33.1	0.77	121.7	-41	32.3	1.30	162
GTRA08	20461	1750.	0.	0.	-1750.	449.	2278.	29.	183.	2.35	0.15	0.36	71.0	1.66	138.5	0	37.8	1.52	133
GTRA12	20461	925.	0.	0.	-925.	70.	1009.	29.	29.	1.54	0.15	0.14	33.3	0.78	122.7	-41	32.3	1.30	162
GTRA12	20461	1730.	0.	0.	-1730.	445.	2266.	29.	182.	2.33	0.15	0.36	70.3	1.64	138.7	0	37.3	1.50	133
GTRA16	20461	925.	0.	0.	-925.	70.	1009.	29.	29.	1.56	0.15	0.14	34.0	0.79	125.6	-44	32.4	1.30	162
GTRA16	20461	1675.	0.	0.	-1675.	420.	2182.	29.	171.	2.35	0.15	0.36	71.3	1.66	145.2	0	37.4	1.51	133
GTR208	20461	926.	0.	0.	-926.	70.	1009.	29.	29.	1.51	0.15	0.14	32.0	0.75	118.1	-37	32.1	1.29	163
GTR208	20461	1538.	0.	0.	-1538.	354.	1960.	29.	144.	1.95	0.15	0.34	56.1	1.31	124.6	0	35.5	1.43	138
GTR212	20461	927.	0.	0.	-927.	70.	1009.	29.	29.	1.52	0.15	0.14	32.6	0.76	119.9	-39	32.3	1.30	162
GTR212	20461	1603.	0.	0.	-1603.	380.	2048.	29.	155.	2.07	0.15	0.34	60.7	1.42	129.3	0	36.4	1.46	136
GTR216	20461	924.	0.	0.	-924.	70.	1009.	29.	29.	1.54	0.15	0.14	33.2	0.78	122.7	-41	32.3	1.30	162
GTR216	20461	1605.	0.	0.	-1605.	389.	2077.	29.	158.	2.18	0.15	0.35	65.0	1.52	138.2	0	36.5	1.47	135

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POW. MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTRW08	20461	952.	0.	0.	-952.	70.	[illegible]	29.	29.	1.53	0.15	0.12	32.9	0.77	118.0	-43	33.0	1.33	160
GTRW08	20461	2143.	0.	0.	-2143.	541.	[illegible]	29.	220.	2.44	0.15	0.31	73.0	1.70	116.3	0	44.0	1.77	130
GTRW12	20461	945.	0.	0.	-945.	70.	1009.	29.	29.	1.53	0.15	0.12	32.9	0.77	118.8	-42	32.8	1.32	161
GTRW12	20461	2132.	0.	0.	-2132.	558.	2643.	29.	227.	2.47	0.15	0.33	74.3	1.73	118.9	0	42.7	1.72	130
GTRW16	20461	944.	0.	0.	-944.	70.	1009.	29.	29.	1.55	0.15	0.12	33.4	0.78	120.9	-44	32.9	1.32	160
GTRW16	20461	2042.	0.	0.	-2042.	524.	2530.	29.	214.	2.46	0.15	0.33	74.2	1.73	124.0	0	42.2	1.70	130
GTR308	20461	956.	0.	0.	-956.	70.	1009.	29.	29.	1.52	0.15	0.11	32.1	0.75	114.5	-41	33.0	1.33	160
GTR308	20461	1826.	0.	0.	-1826.	407.	2137.	29.	166.	2.07	0.15	0.28	59.5	1.39	111.2	0	41.1	1.66	132
GTR312	20461	944.	0.	0.	-944.	70.	1009.	29.	29.	1.51	0.15	0.13	32.1	0.75	116.1	-40	32.7	1.32	161
GTR312	20461	1899.	0.	0.	-1899.	467.	2338.	29.	190.	2.19	0.15	0.32	63.9	1.49	114.8	0	[illegible]	1.62	132
GTR316	20461	944.	0.	0.	-944.	70.	1009.	29.	29.	1.53	0.15	0.12	32.7	0.76	118.3	-42	32.8	1.32	161
GTR316	20461	1888.	0.	0.	-1888.	460.	2316.	29.	188.	2.24	0.15	0.32	65.9	1.54	119.2	0	40.5	1.63	132
FCPADS	20461	980.	0.	0.	-980.	70.	1009.	29.	29.	3.73	0.15	0.09	42.7	1.00	148.7	999	37.1	1.49	154
FCPADS	20461	3876.	0.	0.	-3876.	1059.	4320.	29.	432.	38.13	0.15	0.28	244.7	5.71	215.4	0	116.6	4.69	177
FCMCDS	20461	947.	0.	0.	-947.	70.	1009.	29.	29.	3.59	0.15	0.12	43.9	1.02	158.2	999	36.1	1.45	156
FCMCDS	20461	2828.	0.	0.	-2828.	838.	3579.	29.	342.	28.67	0.15	0.36	210.2	4.91	253.7	0	86.4	3.48	159

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	20631	0.	12.	316.	0.	0.	0.	F	5.	0.	1.13	0.05	0.	20.6	1.00	198.2	0	5.5	1.00	80
STM141	20631	0.	297.	0.	0.	-285.	316.		5.	5.	0.89	0.05	0.10	11.7	0.57	107.1	-1	5.2	0.94	156
STM141	20631	0.	384.	0.	0.	-319.	495.		5.	27.	0.87	0.05	0.31	16.3	0.79	120.4	999	5.1	0.93	133
STM141	20631	0.	0.	297.	0.	12.	20.	F	5.	5.	1.67	0.05	0.10	26.6	1.29	243.1	0	6.3	1.14	139
STM141	20631		0.	384.	0.	65.	111.	F	5.	27.	1.53	0.05	0.31	29.2	1.42	216.4	4	5.6	1.01	120
STM141	20631		0.	297.	0.	12.	20.	A	5.	5.	1.57	0.05	0.10	25.1	1.22	229.5	0	6.0	1.10	140
STM141	20631	0.	0.	384.	0.	65.	111.	A	5.	27.	1.27	0.05	0.31	21.3	1.03	157.5	79	4.4	0.80	123
STM088	20631	0.	297.	0.	0.	-285.	316.		5.	5.	0.89	0.05	0.10	11.5	0.56	105.3	-1	5.2	0.94	156
STM088	20631	0.	362.	0.	0.	-310.	450.		5.	21.	0.83	0.05	0.28	14.7	0.72	114.7	999	5.1	0.92	136
STM088	20631	0.	0.	297.	0.	12.	20.	F	5.	5.	1.68	0.05	0.10	26.6	1.29	243.0	0	6.3	1.15	139
STM088	20631	0.	0.	362.	0.	51.	88.	F	5.	21.	1.46	0.05	0.28	27.2	1.32	211.9	5	5.5	1.00	123
STM088	20631	0.	0.	297.	0.	12.	20.	A	5.	5.	1.58	0.05	0.10	25.0	1.21	228.5	0	6.0	1.10	140
STM088	20631	0.	0.	362.	0.	51.	88.	A	5.	21.	1.23	0.05	0.28	20.3	0.99	158.0	999	4.5	0.82	125
PFBSTM	20631	0.	0.	297.	0.	12.	19.		5.	5.	1.61	0.05	0.09	26.3	1.28	240.8	0	6.2	1.13	139
PFBSTM	20631	0.	0.	434.	0.	94.	159.		5.	38.	1.86	0.05	0.37	34.8	1.69	232.4	2	6.0	1.09	119
TISTMT	20631	0.	297.	0.	0.	-285.	316.		5.	5.	1.13	0.05	0.09	22.2	1.08	203.3	0	6.6	1.19	145
TISTMT	20631	0.	437.	0.	0.	-342.	596		5.	39.	2.48	0.05	0.37	72.4	3.52	480.9	0	12.6	2.28	136
TISTMT	20631	0.	0.	297.	0.	12.	19.		5.	5.	1.87	0.05	0.09	36.1	1.75	329.8	0	7.5	1.37	138
TISTMT	20631	0.	0.	481.	0.	121.	203.		5.	50.	3.50	0.05	0.40	105.9	5.15	648.2	0	14.9	2.71	145
TIHRSG	20631	0.	301.	0.	0.	-289.	316.		5.	5.	1.26	0.05	0.08	29.5	1.44	267.4	0	7.4	1.35	141
TIHRSG	20631	0.	348.	0.	0.	-313.	395.		5.	14.	1.97	0.05	0.19	57.8	2.81	464.6	0	11.0	2.00	132
TIHRSG	20631	0.	0.	301.	0.	12.	16.		5.	5.	2.03	0.05	0.08	46.3	2.25	419.3	0	8.9	1.61	138
TIHRSG	20631	0.	0.	367.	0.	45.	61.		5.	18.	2.79	0.05	0.22	85.1	4.14	654.3	0	13.3	2.41	135
STIRL	20631	305.	0.	0.	-305.	12.	316.		5.	5.	0.89	0.05	0.07	14.3	0.70	128.0	-12	6.2	1.13	152
STIRL	20631	522.	0.	0.	-522.	104.	625.		5.	42.	1.44	0.05	0.28	31.4	1.53	178.9	0	8.8	1.60	123
STIRL	20631	0.	305.	0.	0.	-293.	316.		5.	5.	0.89	0.05	0.07	14.3	0.70	128.0	-5	5.5	1.00	148
STIRL	20631	0.	522.	0.	0.	-418.	625.		5.	42.	1.44	0.05	0.28	31.4	1.53	179.2	0	7.6	1.39	117
STIRL	20631	0.	0.	305.	0.	12.	11.		5.	5.	1.59	0.05	0.07	26.9	1.31	241.2	0	6.2	1.13	136
STIRL	20631	0.	0.	569.	0.	132.	131.		5.	54.	2.43	0.05	0.31	62.4	3.03	320.0	0	9.3	1.69	114
HEGT85	20631	0.	0.	312.	0.	12.	5.	A	5.	5.	1.62	0.05	0.05	32.9	1.60	289.1	0	7.0	1.27	132
HEGT85	20631	0.	0.	1031.	0.	255.	102.	A	5.	104.	4.24	0.05	0.26	133.9	6.51	412.8	0	18.4	3.34	139
HEGT60	20631	0.	0.	312.	0.	12.	4.	A	5.	5.	1.62	0.05	0.05	32.5	1.58	285.4	0	7.0	1.27	132
HEGT60	20631	0.	0.	716.	0.	147.	56.	A	5.	60.	2.98	0.05	0.22	90.0	4.38	387.9	0	13.4	2.43	116
HEGT00	20631	0.	0.	313.	0.	12.	3.	A	5.	5.	1.63	0.05	0.04	32.0	1.55	280.0	0	6.9	1.26	132
HEGT00	20631	0.	0.	501.	0.	73.	20.	A	5.	30.	2.04	0.05	0.16	57.2	2.78	336.0	0	9.6	1.74	103
FCNCCL	20631	0.	0.	377.	0.	12.	-61.		5.	5.	1.69	0.05	-0.15	33.4	1.62	302.2	0	7.6	1.38	109
FCNCCL	20631	0.	0.	636.	0.	138.	108.		5.	56.	2.81	0.05	0.28	70.9	3.45	382.3	0	11.1	2.01	116
FCSTCL	20631	0.	0.	376.	0.	12.	-60.		5.	5.	1.72	0.05	-0.15	32.5	1.58	294.4	0	7.5	1.37	110
FCSTCL	20631	0.	0.	822.	0.	244.	273.		5.	100.	3.67	0.05	0.39	92.1	4.48	382.4	0	12.6	2.29	133
IGGTST	20631	0.	0.	381.	0.	12.	-65.		5.	5.	1.75	0.05	-0.16	31.6	1.54	282.8	0	7.5	1.36	109
IGGTST	20631	0.	0.	767.	0.	175.	97.		5.	71.	2.60	0.05	0.26	71.5	3.47	318.0	0	10.7	1.95	112
GTSOAR	20631	0.	303.	0.	0.	-292.	316.		5.	5.	0.84	0.05	0.07	13.7	0.66	122.9	-3	5.4	0.98	150
GTSOAR	20631	0.	519.	0.	0.	-411.	640.		5.	44.	1.16	0.05	0.31	23.5	1.14	134.5	0	6.4	1.16	121

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----FUEL USE IN BTU*10**6---- **COGENERATION CASE**			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC08	20631	0.	301.	0.	0.	-290.	316.	5.	5.	0.82	0.05	0.08	13.1	0.64	118.4	-2	5.3	0.96	151
GTAC08	20631	0.	464.	0.	0.	-374.	579.	5.	37.	1.05	0.05	0.31	19.6	0.95	123.9	-17	5.8	1.05	125
GTAC12	20631	0.	301.	0.	0.	-289.	316.	5.	5.	0.82	0.05	0.08	13.1	0.64	118.3	-2	5.3	0.96	151
GTAC12	20631	0.	499.	0.	0.	-390.	644.	5.	45.	1.13	0.05	0.34	22.3	1.08	132.2	0	6.0	1.09	124
GTAC16	20631	0.	301.	0.	0.	-290.	316.	5.	5.	0.82	0.05	0.08	13.2	0.64	119.6	-2	5.3	0.96	151
GTAC16	20631	0.	526.	0.	0.	-404.	686.	5.	50.	1.20	0.05	0.35	24.8	1.20	140.4	0	6.3	1.14	124
GTWC16	20631	0.	304.	0.	0.	-293.	316.	5.	5.	0.83	0.05	0.07	13.5	0.66	121.0	-3	5.4	0.97	149
GTWC16	20631	0.	585.	0.	0.	-453.	721.	5.	54.	1.22	0.05	0.31	24.9	1.21	128.7	0	6.6	1.20	120
CC1626	20631	0.	304.	0.	0.	-293.	316.	5.	5.	0.89	0.05	0.07	13.4	0.65	120.1	-3	5.4	0.99	150
CC1626	20631	0.	824.	0.	0.	-587.	1074.	5.	97.	1.64	0.05	0.37	35.0	1.70	132.5	0	7.9	1.43	125
CC1622	20631	0.	303.	0.	0.	-292.	316.	5.	5.	0.89	0.05	0.08	13.1	0.64	118.2	-3	5.4	0.98	151
CC1622	20631	0.	750.	0.	0.	-536.	906.	5.	87.	1.61	0.05	0.38	34.6	1.68	142.6	0	7.6	1.39	125
CC1222	20631	0.	303.	0.	0.	-291.	316.	5.	5.	0.88	0.05	0.08	13.0	0.63	117.0	-3	5.4	0.98	151
CC1222	20631	0.	746.	0.	0.	-531.	995.	5.	87.	1.58	0.05	0.38	32.9	1.60	136.7	0	7.4	1.34	126
CC0822	20631	0.	301.	0.	0.	-290.	316.	5.	5.	0.89	0.05	0.08	13.2	0.64	119.2	-3	5.4	0.98	151
CC0822	20631	0.	630.	0.	0.	-457.	857.	5.	71.	1.43	0.05	0.39	28.1	1.37	135.8	0	6.6	1.20	126
STIG15	20631	0.	319.	0.	0.	-308.	316.	5.	5.	0.91	0.05	0.03	16.3	0.79	140.2	-10	5.9	1.07	141
STIG15	20631	0.	18154.	0.	0.	-13183.	16921.	5.	2027.	20.00	0.05	0.17	510.6	24.82	95.6	0	128.0	23.25	620
STIG10	20631	0.	315.	0.	0.	-304.	316	5.	5.	0.83	0.05	0.04	13.1	0.64	113.8	-4	5.4	0.98	146
STIG10	20631	0.	1781.	0.	0.	-1321.	1817.	5.	187.	2.56	0.05	0.22	56.7	2.76	104.2	0	14.9	2.70	129
STIG1S	20631	0.	314.	0.	0.	-302.	316.	5.	5.	0.83	0.05	0.04	13.0	0.63	113.8	-4	5.4	0.98	147
STIG1S	20631	0.	1120.	0.	0.	-850.	1181.	5.	110.	1.90	0.05	0.23	39.1	1.90	111.7	0	10.6	1.93	117
DEADV3	20631	0.	308.	0.	0.	-296.	316.	5.	5.	0.92	0.05	0.06	16.3	0.79	145.0	-9	5.8	1.05	145
DEADV3	20631	0.	929.	0.	0.	-681.	1107.	5.	101.	2.51	0.05	0.31	70.2	3.41	238.3	0	13.2	2.39	130
DEHTPH	20631	0.	299.	0.	0.	-287.	316.	5.	5.	0.95	0.05	0.09	16.2	0.79	147.4	-8	5.7	1.04	148
DEHTPH	20631	0.	537.	0.	0.	-396.	749.	5.	57.	1.80	0.05	0.40	42.8	2.08	238.3	0	8.4	1.52	127
DESOA3	20631	311.	0.	0.	-311.	12.	316.	5.	5.	0.91	0.05	0.05	15.5	0.75	136.8	-15	6.4	1.17	148
DESOA3	20631	1072.	0.	0.	-1072.	278.	1209.	5.	113.	3.19	0.05	0.28	96.0	4.67	285.3	0	19.7	3.57	151
DESOA3	20631	0.	311.	0.	0.	-299.	316.	5.	5.	0.91	0.05	0.05	15.5	0.75	136.8	-8	5.7	1.04	145
DESOA3	20631	0.	1072.	0.	0.	-794.	1209.	5.	113.	3.19	0.05	0.23	96.0	4.67	285.3	0	17.2	3.13	140
GTSOAD	20631	302.	0.	0.	-302.	12.	316.	5.	5.	0.82	0.05	0.08	12.9	0.63	116.3	-9	5.9	1.08	154
GTSOAD	20631	496.	0.	0.	-496.	104.	626.	5.	42.	1.07	0.05	0.32	20.0	0.97	119.1	-67	6.9	1.26	130
GTRA08	20631	303.	0.	0.	-303.	12.	316.	5.	5.	0.83	0.05	0.08	13.8	0.67	124.5	-10	6.1	1.10	153
GTRA08	20631	627.	0.	0.	-627.	161.	816.	5.	66.	1.40	0.05	0.36	32.0	1.56	155.5	0	8.7	1.57	129
GTRA12	20631	302.	0.	0.	-302.	12.	316.	5.	5.	0.83	0.05	0.08	13.8	0.67	123.9	-10	6.1	1.10	153
GTRA12	20631	620.	0.	0.	-620.	159.	811.	5.	65.	1.37	0.05	0.36	30.7	1.49	150.5	0	8.4	1.53	129
GTRA16	20631	302.	0.	0.	-302.	12.	316.	5.	5.	0.84	0.05	0.08	14.0	0.68	125.9	-11	6.1	1.11	153
GTRA16	20631	600.	0.	0.	-600.	151.	782.	5.	61.	1.37	0.05	0.36	31.1	1.51	156.8	0	8.5	1.54	129
GTR208	20631	303.	0.	0.	-303.	12.	316.	5.	5.	0.83	0.05	0.08	13.5	0.66	121.7	-10	6.0	1.10	153
GTR208	20631	551.	0.	0.	-551.	127.	702.	5.	52.	1.22	0.05	0.34	25.2	1.22	137.0	0	7.7	1.40	128
GTR212	20631	303.	0.	0.	-303.	12.	316.	5.	5.	0.83	0.05	0.08	13.6	0.66	122.8	-10	6.1	1.10	153
GTR212	20631	574.	0.	0.	-574.	136.	733.	5.	56.	1.27	0.05	0.34	27.0	1.31	141.6	0	8.0	1.45	128
GTR216	20631	302.	0.	0.	-302.	12.	316.	5.	5.	0.83	0.05	0.08	13.7	0.67	123.8	-10	6.1	1.10	153
GTR216	20631	575.	0.	0.	-575.	139.	744.	5.	57.	1.31	0.05	0.35	28.6	1.39	149.7	0	8.1	1.48	128

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																
		COGENERATION CASE			**NOCOGEN - COGEN**													
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTRW08	20631	307.	0.	0.	-307.	12.	316.	5.	5.	0.81	0.05	0.06	13.9	0.68	123.7	-11	6.1	1.11	151
GTRW03	20631	767.	0.	0.	-767.	194.	926.	5.	79.	1.44	0.05	0.31	32.2	1.57	130.3	0	9.6	1.75	128
GTRW12	20631	306.	0.	0.	-306.	12.	316.	5.	5.	0.83	0.05	0.07	13.9	0.68	124.0	-11	6.1	1.11	152
GTRW12	20631	764.	0.	0.	-764.	200.	946.	5.	81.	1.45	0.05	0.33	32.7	1.59	133.0	0	9.5	1.72	129
GTRW16	20631	306.	0.	0.	-306.	12.	316.	5.	5.	0.84	0.05	0.07	14.1	0.68	125.7	-11	6.1	1.11	151
GTRW16	20631	731.	0.	0.	-731.	188.	906.	5.	77.	1.44	0.05	0.33	32.7	1.59	138.2	0	9.4	1.70	128
GTR308	20631	307.	0.	0.	-307.	12.	316.	5.	5.	0.83	0.05	0.06	13.6	0.66	120.6	-10	6.1	1.11	152
GTR308	20631	654.	0.	0.	-654.	146.	765.	5.	59.	1.28	0.05	0.28	26.7	1.30	124.9	0	8.7	1.58	124
GTR312	20631	305.	0.	0.	-305.	12.	316.	5.	5.	0.83	0.05	0.07	13.6	0.66	122.0	-10	6.1	1.10	152
GTR312	20631	680.	0.	0.	-680.	167.	837.	5.	68.	1.33	0.05	0.32	28.5	1.39	128.6	0	8.7	1.58	127
GTR316	20631	306.	0.	0.	-306.	12.	316.	5.	5.	0.84	0.05	0.07	13.8	0.67	123.7	-11	6.1	1.11	152
GTR316	20631	676.	0.	0.	-676.	165.	829.	5.	67.	1.35	0.05	0.32	29.4	1.43	133.1	0	8.9	1.61	127
FCPADS	20631	311.	0.	0.	-311.	12.	316.	5.	5.	0.92	0.05	0.05	14.6	0.71	128.6	-14	6.4	1.15	149
FCPADS	20631	1388.	0.	0.	-1388.	379.	1547.	5.	155.	7.61	0.05	0.28	93.2	4.53	217.1	0	25.1	4.55	176
FCMCDS	20631	306.	0.	0.	-306.	12.	316.	5.	5.	0.91	0.05	0.07	14.8	0.72	132.3	-13	6.3	1.14	151
FCMCDS	20631	1013.	0.	0.	-1013.	300.	1282.	5.	122.	5.96	0.05	0.36	80.4	3.91	251.9	0	19.5	3.54	162

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6 **COGENERATION CASE**			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	20821	0.	15.	151.	0.	0.	0.	A	6.	0.	0.63	0.24	0	7.1	1.00	238.6	0	4.3	1.00	80
STM141	20821	0.	125.	0	0.	-111.	151.		6.	6.	0.61	0.24	0.24	6.9	0.98	188.7	-19	4.4	1.01	161
STM141	20821	0.	132.	0.	0.	-113.	163.		6	8.	0.49	0.24	0.28	6.6	0.94	172.0	993	4.1	0.95	154
STM141	20821	0.	0.	125.	0.	15.	25.	F	6.	6.	1.07	0.24	0.24	13.6	1.92	370.1	5	4.3	0.59	145
STM141	20821	0.	0.	132.	0.	19.	32.	F	6.	8.	0.86	0.24	0.28	12.3	1.74	319.8	12	3.6	0.87	137
STM141	20821	0.	0.	125.	0.	15.	25.	A	6.	6.	0.98	0.24	0.24	11.6	1.64	316.6	10	1.0	0.92	147
STM141	20821	0.	0.	132.	0.	19.	32.	A	6.	8.	0.75	0.24	0.28	9.9	1.39	255.6	24	3.4	0.79	140
STM088	20821	0.	125.	0.	0.	-111.	150.		6.	6.	0.46	0.24	0.24	5.9	0.83	160.0	999	4.1	0.95	153
STM088	20821	0.	0.	126.	0.	15.	25.	F	6.	6.	0.82	0.24	0.24	11.4	1.61	309.6	13	3.8	0.88	135
STM088	20821	0.	0.	126.	0.	15.	25.	A	6.	6.	0.72	0.24	0.24	9.3	1.31	253.4	26	3.5	0.80	138
PFBSTM	20821	0.	0.	126.	0.	15.	25.		6.	6.	1.18	0.24	0.24	15.4	2.18	419.1	2	4.6	1.06	144
PFBSTM	20821	0.	0.	146.	0.	27.	46.		6.	11.	1.06	0.24	0.33	15.3	2.17	358.8	8	4.0	0.92	138
TISTMT	20821	0.	126.	0.	0.	-111.	151.		6.	6.	0.95	0.24	0.24	19.9	2.81	538.1	0	6.1	1.41	149
TISTMT	20821	0.	159.	0.	0.	-125.	217.		6.	14.	1.17	0.24	0.37	33.1	4.68	709.5	0	7.3	1.69	146
TISTMT	20821	0	0.	126.	0.	15.	25.		6.	6.	1.47	0.24	0.24	28.3	4.00	765.8	0	6.3	1.45	145
TISTMT	20821	0.	0.	153.	0.	35.	58.		6.	14.	1.64	0.24	0.37	42.0	5.94	900.4	0	7.2	1.65	142
TIHRSG	20821	0.	129.	7.	0.	-114.	144.		6.	5.	0.88	0.24	0.18	26.1	3.69	703.3	0	6.9	1.59	131
TIHRSG	20821	0	2.	133.	0.	13.	17.		6.	5.	1.27	0.24	0.18	33.7	4.76	906.5	0	6.9	1.59	128
STIRL	20821	132.	0.	0.	-132.	15.	151.		6.	6.	0.58	0.24	0.20	7.0	1.00	182.4	193	5.2	1.20	161
STIRL	20821	190.	0.	0.	-190.	43.	245.		6.	18.	0.58	0.24	0.34	10.9	1.54	195.6	0	5.6	1.28	145
STIRL	20821	0.	132.	0.	0.	-117.	151.		6.	6.	0.59	0.24	0.20	7.0	1.00	182.6	-44	4.5	1.04	157
STIRL	20821	0.	190.	0.	0.	-147.	245.		6.	18.	0.53	0.24	0.34	10.9	1.54	195.8	0	4.5	1.05	140
STIRL	20821	0.	0.	132.	0.	15.	19.		6.	6.	1.05	0.24	0.20	13.9	1.97	360.9	5	4.4	1.00	141
STIRL	20821	0.	0.	190.	0.	43.	55.		6.	18.	1.02	0.24	0.34	18.4	2.60	331.2	8	3.9	0.89	126
HEGT65	20821	0.	0.	133.	0.	15.	18.	A	6.	6.	1.21	0.24	0.20	24.2	3.43	622.1	0	5.7	1.31	138
HEGT65	20821	0	0.	201.	0.	46.	56.	A	6.	19.	1.44	0.24	0.34	40.0	5.65	679.5	0	6.6	1.52	129
HEGT60	20821	0	0.	145.	0.	15.	6.	A	6.	6.	1.22	0.24	0.12	24.0	3.40	565.3	0	5.8	1.35	130
HEGT60	20821	0.	0.	226.	0.	42.	16.	A	6.	17.	1.41	0.24	0.20	37.2	5.26	561.4	0	6.9	1.53	117
HEGT00	20821	0.	0.	147.	0.	15.	4.	A	6.	6.	1.14	0.24	0.11	22.2	3.13	515.1	0	5.6	1.29	128
HEGT00	20821	0.	0.	166.	0.	21.	6.	A	6.	9.	0.99	0.24	0.14	23.6	3.33	485.3	0	5.5	1.26	118
FCMCCL	20821	0	0.	131.	0.	15.	20.		6.	6.	1.25	0.24	0.21	21.3	3.01	555.1	0	5.4	1.25	140
FCMCCL	20821	0.	0.	181.	0.	40.	53.		6.	16.	1.41	0.24	0.34	28.9	4.08	544.7	0	5.6	1.29	131
FCSTCL	20821	0.	0.	130.	0.	15.	21.		6.	6.	1.28	0.24	0.22	20.6	2.92	543.2	0	5.4	1.24	141
FCSTCL	20821	0.	0.	235.	0.	70.	100.		6.	28.	1.66	0.24	0.42	37.4	5.29	543.6	0	5.9	1.35	125
IGGTST	20821	0.	0.	136.	0.	15.	15.		6.	6.	1.27	0.24	0.18	20.8	2.94	521.9	0	5.5	1.26	137
IGGTST	20821	0.	0.	219.	0.	50.	49.		6.	20.	1.32	0.24	0.31	30.7	4.34	478.3	0	5.6	1.29	121
GTSOAR	20821	0	134.	0.	0.	-119.	151.		6.	6.	0.57	0.24	0.19	7.6	1.07	193.1	0	4.6	1.06	153
GTSOAR	20821	0.	189.	0.	0.	-150.	233.		6.	16.	0.50	0.24	0.31	9.9	1.40	178.3	0	4.6	1.05	140
GTAC08	20821	0.	132.	0.	0.	-117.	151.		6.	6.	0.54	0.24	0.20	6.9	0.97	177.7	-20	4.4	1.02	157
GTAC08	20821	0	169.	0.	0.	-136.	211.		6.	13.	0.45	0.24	0.31	7.9	1.12	159.6	17	4.2	0.97	147
GTAC12	20821	0.	131.	0.	0.	-116.	151.		6.	6.	0.55	0.24	0.21	6.9	0.98	180.4	-22	4.4	1.02	157
GTAC12	20821	0.	182.	0.	0.	-142.	235.		6.	16.	0.48	0.24	0.34	9.0	1.27	168.0	9	4.2	0.98	144
GTAC16	20821	0.	131.	0.	0.	-116.	151.		6.	6.	0.55	0.24	0.21	7.2	1.01	186.0	-67	4.5	1.03	156

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		-----------FUEL USE IN BTU*10**6----------- **COGENERATION CASE**			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC16	20821	0.	192.	0.	0.	-147.	250.	6.	18.	0.51	0.24	0.35	10.0	1.42	178.7	5	4.3	1.00	140
GTWC16	20821	0.	136.	0.	0.	-121.	151.	6.	6.	0.56	0.24	0.18	7.5	1.06	188.1	0	4.6	1.06	153
GTWC16	20821	0.	213.	0.	0.	-165.	263.	6.	20.	0.54	0.24	0.31	10.7	1.51	170.5	0	4.7	1.08	135
CC1626	20821	0.	135.	0.	0.	-120.	151.	6.	6.	0.55	0.24	0.18	7.7	1.08	193.6	0	4.7	1.09	153
CC1626	20821	0.	300.	0.	0.	-214.	391.	6.	35	0.81	0.24	0.37	15.6	2.20	176.9	0	5.2	1.21	123
CC1622	20821	0.	134.	0.	0.	-119.	151.	6.	6.	0.64	0.24	0.19	7.4	1.04	188.4	0	4.7	1.07	155
CC1622	20821	0.	273.	0.	0.	-195.	363.	6.	32.	0.76	0.24	0.38	14.8	2.07	182.7	0	5.0	1.15	126
CC1222	20821	0.	134	0.	0.	-119.	151.	6.	6.	0.64	0.24	0.19	7.2	1.02	184.4	0	4.6	1.07	155
CC1222	20821	0.	272.	0.	0.	-194.	363.	6.	32.	0.75	0.24	0.38	14.0	1.97	175.4	0	4.9	1.12	126
CC0822	20821	0.	131.	0.	0.	-117.	151.	6.	6.	0.64	0.24	0.21	7.4	1.04	191.4	0	4.6	1.06	156
CC0822	20821	0.	230.	0.	0.	-166.	312.	6.	26.	0.69	0.24	0.39	12.1	1.72	180.3	1	4.5	1.04	133
STIG15	20821	0.	154.	0.	0.	-140.	151.	6.	6.	0.62	0.24	0.07	7.7	1.09	170.0	0	5.1	1.19	141
STIG15	20821	0.	6615.	0.	0.	-4804.	6166.	6.	739.	10.73	0.24	0.17	196.6	27.78	101.4	0	78.6	18.14	492
STIG10	20821	0.	150.	0.	0.	-135.	151.	6.	6.	0.6[illegible]	0.24	0.10	7.4	1.04	167.9	0	5.0	1.15	145
STIG10	20821	0.	649.	0.	0.	-482.	662.	6.	68.	1.27	0.24	0.22	22.7	3.21	119.4	0	9.8	2.25	116
STIG15	20821	0.	147	0.	0.	-133.	151.	6.	6.	0.60	0.24	0.11	[illegible]	1.02	167.3	999	4.9	1.13	147
STIG15	20821	0.	408.	0.	0.	-310.	430.	6.	40.	0.92	0.24	0.23	15.4	2.18	129.1	0	7.2	1.65	114
DEADV3	20821	0.	132.	0.	0.	-118.	151.	6.	6.	0.64	0.24	0.20	9.4	1.33	242.6	0	4.8	1.11	151
DEADV3	20821	0.	231.	0.	0.	-169.	307.	6.	25.	0.77	0.24	0.37	17.5	2.47	258.7	0	5.3	1.21	129
DEHTPM	20821	0.	128.	0.	0.	-114.	151.	6.	6.	0.67	0.24	0.22	9.4	1.32	248.6	0	4.7	1.09	154
DEHTPM	20821	0.	196.	0.	0.	-144.	273.	6.	21.	0.74	0.24	0.40	15.0	2.12	262.1	0	4.8	1.10	137
DESOA3	20821	134.	0.	0.	-134.	15.	151.	6.	6.	0.63	0.24	0.19	8.8	1.25	225.7	0	5.5	1.27	155
DESOA3	20821	235.	0.	0.	-235.	61.	305.	6.	25.	0.87	0.24	0.36	21.3	3.01	308.6	0	7.2	1.65	135
DESOA3	20821	0.	134.	0.	0.	-119.	151.	6.	6.	0.63	0.24	0.19	8.8	1.25	225.7	0	4.8	1.10	151
DESOA3	20821	0	235.	0.	0.	-174.	305.	6.	25.	0.87	0.24	0.36	21.3	3.01	308.6	0	5.9	1.36	128
GTSOAD	20821	132.	0.	0.	-132.	15.	151.	6.	6.	0.54	0.24	0.20	6.7	0.94	171.9	-70	5.1	1.18	161
GTSOAD	20821	181.	0.	0.	-181.	38.	228.	6.	15.	0.45	0.24	0.32	8.0	1.14	151.8	0	5.2	1.20	151
GTRA08	20821	133.	0.	0.	-133.	15.	151.	6.	6.	0.57	0.24	0.19	7.9	1.12	202.1	0	5.3	1.23	157
GTRA08	20821	228.	0.	0.	-228	59.	297.	6.	24.	0.60	0.24	0.36	13.0	1.83	193.8	0	6.0	1.38	138
GTRA12	20821	133.	0.	0.	-133.	15.	151.	6.	6.	0.57	0.24	0.20	7.8	1.11	201.0	0	5.3	1.22	158
GTRA12	20821	226.	0.	0.	-226.	58.	[illegible]	6.	24.	0.60	0.24	0.36	13.1	1.85	197.3	0	5.9	1.37	139
GTRA16	20821	133.	0.	0.	-133	15.	151.	6.	6.	0.58	0.24	0.20	8.1	1.14	207.5	0	5.3	1.23	157
GTRA16	20821	219.	0	0.	-219	55.	285.	6.	22.	0.60	0.24	0.36	13.3	1.87	207.0	0	6.0	1.37	139
GTR208	20821	133.	0.	0.	-133.	15.	151.	6.	6.	0.56	0.24	0.20	7.5	1.06	191.4	0	5.3	1.22	159
GTR208	20821	201.	0.	0.	-201.	46.	256.	6.	19.	0.53	0.24	0.34	10.5	1.49	179.3	0	5.6	1.29	144
GTR212	20821	133.	0.	0.	-133.	15.	151.	6.	6.	0.57	0.24	0.19	7.6	1.08	195.6	0	5.3	1.22	158
GTR212	20821	209.	0.	0.	-209.	50.	267.	6.	20.	0.55	0.24	0.34	11.4	1.61	186.0	0	5.7	1.33	142
GTR216	20821	133.	0.	0.	-133.	15.	151.	6.	6.	0.57	0.24	0.20	7.8	1.10	199.9	0	5.3	1.22	158
GTR216	20821	209	0.	0.	-209.	51.	271.	6.	21.	0.57	0.24	0.35	12.0	1.70	195.6	0	5.8	1.33	141
GTRW08	20821	139.	0.	0.	-139.	15.	151.	6.	6.	0.58	0.24	0.16	8.0	1.13	197.1	0	5.5	1.27	154
GTRW08	20821	280.	0.	0.	-280.	71.	337.	6.	29.	0.66	0.24	0.31	14.4	2.03	175.2	0	6.9	1.60	132
GTRW12	20821	137.	0.	0.	-137.	15.	151.	6.	6.	0.58	0.24	0.17	8.0	1.13	199.0	0	5.5	1.26	155
GTRW12	20821	278.	0.	0.	-278.	73.	345.	6.	30.	0.66	0.24	0.33	14.6	2.06	179.1	0	6.8	1.57	132
GTRW16	20821	137.	0.	0.	-137.	15.	151.	6.	6.	0.58	0.24	0.17	8.2	1.16	204.2	0	5.5	1.26	155

SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----------FUEL USE IN BTU*10**6----------																	
		COGENERATION CASE			* NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTRW16	20821	267.	0.	0.	-267.	68.	330.	6.	28.	0.66	0.24	0.33	14.6	2.07	187.2	0	6.7	1.55	133
GTR308	20821	139.	0.	0.	-139.	15.	151.	6.	6.	0.57	0.24	0.16	7.6	1.07	185.4	0	5.5	1.26	155
GTR308	20821	238.	0.	0.	-238.	53.	279.	6.	22.	0.57	0.24	0.28	11.5	1.62	164.6	0	6.4	1.48	136
GTR312	20821	137.	0.	0.	-137.	15.	151.	6.	6.	0.57	0.24	0.17	7.7	1.09	191.7	0	5.4	1.25	156
GTR312	20821	248.	0.	0.	-248.	61.	305.	6.	25.	0.60	0.24	0.32	12.5	1.76	171.5	0	6.3	1.46	136
GTR316	20821	137.	0.	0.	-137.	15.	151.	6.	6.	0.56	0.24	0.17	7.9	1.12	197.2	0	5.4	1.26	155
GTR316	20821	246.	0.	0.	-246.	60.	302.	6.	24.	0.61	0.24	0.32	12.9	1.83	178.9	0	6.4	1.48	135
FCPADS	20821	133.	0.	0.	-133.	15.	151.	6.	6.	0.92	0.24	0.20	7.6	1.07	195.4	0	5.6	1.30	161
FCPADS	20821	240.	0.	0.	-240.	66.	321.	6.	27.	2.52	0.24	0.38	16.7	2.36	237.1	0	8.2	1.89	146
FCMCDS	20821	137.	0.	0.	-137.	15.	151.	6.	6.	0.91	0.24	0.17	8.2	1.16	203.4	0	5.8	1.34	156
FCMCDS	20821	369.	0.	0.	-369.	109.	467.	6.	45.	3.91	0.24	0.36	29.3	4.14	270.6	0	12.0	2.77	147

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD	POWER		/HEAT		COST	COST	EQVL		CHRG	ENRG	
									MW	MW		RATIO		*10**6			(%)			
ONOCGN	22601	0.	15.	237.	0.	0.	0.	F	6.	0.	0.87	0.13	0.	13.5	1.00	247.5	0	6.3	1.00	80
STM141	22601	0.	211.	0.	0.	-196.	237.		6.	6.	0.76	0.13	0.16	9.1	0.68	148.0	-9	6.5	1.04	162
STM141	22601	0.	226.	0.	0.	-201.	268.		6.	10.	0.60	0.13	0.23	8.8	0.65	132.6	-2	6.1	0.98	156
STM141	22601	0.	0.	211.	0.	15.	26.	F	6.	6.	1.40	0.13	0.16	19.3	1.43	313.2	5	6.3	1.00	142
STM141	22601	0.	0.	226.	0.	24.	42.	F	6.	10.	1.11	0.13	0.23	17.4	1.29	262.3	18	5.4	0.87	138
STM141	22601	0.	0.	211.	0.	15.	26.	A	6.	6.	1.29	0.13	0.16	16.7	1.24	270.4	13	5.9	0.94	144
STM141	22601	0.	0.	226.	0.	24.	42.	A	6.	10.	0.97	0.13	0.23	13.2	0.98	199.1	999	4.8	0.77	140
STM088	22601	0.	211.	0.	0.	-196.	237.		6.	6.	0.72	0.13	0.16	8.4	0.63	136.7	-7	6.4	1.02	164
STM088	22601	0.	215.	0.	0.	-197.	246.		6.	7.	0.57	0.13	0.18	7.8	0.58	123.6	-3	6.1	0.98	156
STM088	22601	0.	0.	211.	0.	15.	26.	F	6.	6.	1.32	0.13	0.16	18.0	1.34	291.6	8	6.0	0.96	143
STM088	22601	0.	0.	215.	0.	18.	31.	F	6.	7.	1.05	0.13	0.18	16.0	1.19	253.7	23	5.5	0.87	135
STM088	22601	0.	0.	211.	0.	15.	26.	A	6.	6.	1.21	0.13	0.16	15.0	1.11	242.5	28	5.6	0.89	145
STM088	22601	0.	0.	215.	0.	18.	31.	A	6.	7.	0.93	0.13	0.18	12.4	0.92	197.1	999	5.0	0.79	139
PFBSTM	22601	0.	0.	212.	0.	15.	25.		6.	6.	1.48	0.13	0.16	20.6	1.53	332.6	2	6.5	1.04	141
PFBSTM	22601	0.	0.	252.	0.	39.	65.		6.	16.	1.45	0.13	0.29	21.3	1.58	289.1	10	5.7	0.91	132
TISTMT	22601	0.	211.	0.	0.	-196.	237.		6.	6.	1.11	0.13	0.16	23.2	1.72	375.2	0	8.4	1.34	146
TISTMT	22601	0.	273.	0.	0.	-221.	360.		6.	21.	1.63	0.13	0.34	48.8	3.62	609.6	0	10.9	1.75	137
TISTMT	22601	0.	0.	211.	0.	15.	25.		6.	6.	1.78	0.13	0.16	34.8	2.58	562.3	0	8.3	1.33	138
TISTMT	22601	0.	0.	273.	0.	52.	87.		6.	21.	2.27	0.13	0.34	62.0	4.60	774.1	0	10.4	1.56	132
TIHRSG	22601	0.	221.	0.	0.	-205.	237.		6.	6.	1.24	0.13	0.12	32.0	2.37	495.0	0	9.6	1.54	140
TIHRSG	22601	0.	242.	0.	0.	-217.	268.		6.	10.	1.34	0.13	0.17	42.2	3.13	595.3	0	10.7	1.71	133
TIHRSG	22601	0.	0.	221.	0.	15.	16.		6.	6.	1.93	0.13	0.12	44.6	3.31	690.7	0	9.7	1.54	135
TIHRSG	22601	0.	0.	242.	0.	24.	26.		6.	10.	1.93	0.13	0.17	54.2	4.02	765.5	0	10.4	1.67	129
STIRL	22601	222.	0.	0.	-222.	15.	237.		6.	6.	0.73	0.13	0.12	10.0	0.74	153.7	-30	8.0	1.27	159
STIRL	22601	335.	0.	0.	-335.	62.	394.		6.	25.	0.84	0.13	0.26	18.4	1.37	187.5	0	9.4	1.49	135
STIRL	22601	0.	222.	0.	0.	-207.	237.		6.	6.	0.73	0.13	0.12	10.0	0.74	153.8	-15	6.8	1.09	155
STIRL	22601	0.	335.	0.	0.	-273.	394.		6.	25.	0.84	0.13	0.26	18.4	1.37	187.8	0	7.6	1.22	128
STIRL	22601	0.	0.	222.	0.	15.	14.		6.	6.	1.35	0.13	0.12	19.9	1.47	305.0	3	6.4	1.02	136
STIRL	22601	0.	0.	335.	0.	62.	59.		6.	25.	1.54	0.13	0.26	32.5	2.41	330.6	3	6.6	1.06	113
HEGT85	22601	0.	0.	240.	0.	15.	-3.	A	6.	6.	1.50	0.13	0.05	29.8	2.21	424.5	0	7.9	1.26	125
HEGT85	22601	0.	0.	1018.	0.	235.	-46.	A	6.	96.	4.42	0.13	0.16	126.2	9.36	423.0	0	18.6	2.96	115
HEGT60	22601	0.	0.	237.	0.	15.	-1.	A	6.	6.	1.49	0.13	0.06	29.0	2.15	417.0	0	7.8	1.24	126
HEGT60	22601	0.	0.	504.	0.	94.	-4.	A	6.	38.	2.41	0.13	0.15	65.5	4.86	443.1	0	11.5	1.84	99
HEGT00	22601	0.	0.	236.	0.	15.	1.	A	6.	6.	1.46	0.13	0.06	27.7	2.06	400.7	0	7.6	1.21	127
HEGT00	22601	0.	0.	320.	0.	40.	2.	A	6.	16.	1.51	0.13	0.12	37.5	2.78	400.2	0	8.3	1.32	109
FCMCCL	22601	0.	0.	217.	0.	15.	20.		6.	6.	1.52	0.13	0.14	27.0	2.00	424.9	0	7.4	1.18	136
FCMCCL	22601	0.	0.	333.	0.	73.	96.		6.	30.	2.15	0.13	0.34	44.7	3.31	457.3	0	8.1	1.29	118
FCSTCL	22601	0.	0.	215.	0.	15.	21.		6.	6.	1.55	0.13	0.15	26.3	1.95	416.4	0	7.3	1.17	137
FCSTCL	22601	0.	0.	404.	0.	112.	159.		6.	46.	2.67	0.13	0.40	54.4	4.04	460.3	0	8.3	1.33	116
IGGTST	22601	0.	0.	223.	0.	15.	14.		6.	6.	1.54	0.13	0.12	26.3	1.95	402.6	0	7.4	1.18	134
IGGTST	22601	0.	0.	376.	0.	78.	72.		6.	32.	1.74	0.13	0.29	43.5	3.23	394.6	0	7.8	1.25	110
GTSOAR	22601	0.	222.	0.	0.	-207.	237.		6.	6.	0.68	0.13	0.12	9.8	0.72	150.1	-13	6.7	1.08	156
GTSOAR	22601	0.	366.	0.	0.	-290.	441.		6.	31.	0.72	0.13	0.29	15.9	1.18	147.7	0	7.1	1.14	128

ECS	PROCS	FUEL USE IN BTU*10**6 – **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC08	22601	0.	217.	0.	0.	-202.	237.	6.	6.	0.66	0.13	0.14	9.1	0.67	142.6	-9	6.5	1.04	159
GTAC08	22601	0.	308.	0.	0.	-248.	386.	6.	24.	0.62	0.13	0.31	12.3	0.91	136.9	-6	6.3	1.00	139
GTAC12	22601	0.	217.	0.	0.	-202.	237.	6.	6.	0.66	0.13	0.14	9.1	0.67	142.8	-9	6.6	1.05	159
GTAC12	22601	0.	340.	0.	0.	-265.	435.	6.	30.	0.68	0.13	0.33	14.4	1.07	144.7	0	6.4	1.03	133
GTAC16	22601	0.	218.	0.	0.	-203.	237.	6.	6.	0.67	0.13	0.14	9.3	0.69	145.6	-10	6.6	1.05	158
GTAC16	22601	0.	363.	0.	0.	-279.	468.	6.	34.	0.73	0.13	0.34	16.4	1.21	153.8	0	6.6	1.06	129
GTWC16	22601	0.	221.	0.	0.	-206.	237.	6.	6.	0.68	0.13	0.12	9.6	0.71	148.1	-12	6.7	1.07	156
GTWC16	22601	0.	391.	0.	0.	-302.	482.	6.	36.	0.75	0.13	0.32	16.5	1.22	144.0	0	7.1	1.13	126
CC1626	22601	0.	221.	0.	0.	-206.	237.	6.	6.	0.76	0.13	0.12	9.7	0.72	149.0	-14	6.8	1.03	156
CC1626	22601	0.	516.	0.	0.	-374.	659.	6.	58.	1.05	0.13	0.36	22.4	1.66	148.0	0	7.8	1.24	121
CC1622	22601	0.	220.	0.	0.	-205.	237.	6.	6.	0.75	0.13	0.13	9.4	0.70	145.9	-13	6.8	1.08	157
CC1622	22601	0.	470.	0.	0.	-343.	612.	6.	52.	1.01	0.13	0.36	21.6	1.60	156.5	0	7.4	1.19	122
CC1222	22601	0.	220.	0.	0.	-204.	237.	6.	6.	0.74	0.13	0.13	9.2	0.68	143.1	-12	6.7	1.07	158
CC1222	22601	0.	466.	0.	0.	-340.	610.	6.	52.	0.99	0.13	0.37	20.5	1.52	149.8	0	7.2	1.16	123
CC0822	22601	0.	217.	0.	0.	-202.	237.	6.	6.	0.75	0.13	0.14	9.4	0.70	147.3	-12	6.7	1.07	159
CC0822	22601	0.	394.	0.	0.	-293.	524.	6.	41.	0.89	0.13	0.37	17.4	1.29	150.6	0	6.7	1.07	128
STIG15	22601	0.	241.	0.	0.	-225.	237.	6.	6.	0.72	0.13	0.05	9.6	0.71	136.5	-18	7.2	1.15	148
STIG15	22601	0.	12154.	0.	0.	-8826.	11328.	6.	1357.	18.28	0.13	0.17	345.3	25.61	96.9	0	135.9	21.70	581
STIG10	22601	0.	236.	0.	0.	-220.	237.	6.	6.	0.70	0.13	0.07	9.3	0.69	134.9	-16	7.0	1.12	151
STIG10	22601	0.	1192.	0.	0.	-885.	1216.	6.	126.	2.02	0.13	0.22	39.8	2.95	114.0	0	16.1	2.57	124
STIG1S	22601	0.	233.	0.	0.	-218.	237.	6.	6.	0.70	0.13	0.07	9.2	0.68	134.6	-15	7.0	1.11	152
STIG1S	22601	0.	750.	0.	0.	-569.	790.	6.	74.	1.36	0.13	0.23	24.2	1.80	110.3	0	11.2	1.79	115
DEADV3	22601	0.	228.	0.	0.	-213.	237.	6.	6.	0.77	0.13	0.09	12.1	0.90	180.9	-35	7.2	1.16	148
DEADV3	22601	0.	733.	0.	0	-538.	840.	6.	80.	1.84	0.13	0.29	53.4	3.96	248.5	0	13.5	2.16	120
DEHTPM	22601	0.	217.	0.	0.	-202.	237.	6.	6.	0.81	0.13	0.14	12.2	0.90	191.7	-30	7.0	1.12	153
DEHTPM	22601	0.	368.	0.	0.	-279.	483.	6.	36.	1.16	0.13	0.36	28.0	2.07	259.6	0	8.1	1.30	124
DESOA3	22601	232.	0.	0.	-232.	15.	237.	6.	6.	0.76	0.13	0.08	11.6	0.86	171.2	-55	8.4	1.35	153
DESOA3	22601	870.	0.	0.	-870.	226.	942.	6.	92.	2.43	0.13	0.25	75.9	5.63	297.4	0	22.3	3.56	146
DESOA3	22601	0.	232.	0.	0.	-217.	237.	6.	6.	0.76	0.13	0.08	11.6	0.86	171.2	-30	7.3	1.16	148
DESOA3	22601	0.	870.	0.	0.	-644.	942.	6.	92.	2.43	0.13	0.25	75.9	5.63	297.4	0	17.8	2.84	128
GTSOAD	22601	219.	0.	0.	-219.	15.	237.	6.	6.	0.66	0.13	0.13	8.8	0.65	137.5	-21	7.7	1.23	163
GTSOAD	22601	341.	0.	0.	-341.	72.	426.	6.	29.	0.64	0.13	0.31	12.8	0.95	128.5	-97	8.2	1.30	142
GTRA08	22601	221.	0.	0.	-221.	15.	237.	6.	6.	0.68	0.13	0.12	10.0	0.74	154.2	-28	7.9	1.26	160
GTRA08	22601	456.	0.	0.	-456.	117.	578.	6.	48.	0.89	0.13	0.34	21.4	1.59	160.1	0	9.9	1.57	130
GTRA12	22601	220.	0.	0.	-220.	15.	237.	6.	6.	0.68	0.13	0.13	9.9	0.74	153.8	-28	7.9	1.25	160
GTRA12	22601	445.	0.	0.	-445.	115.	569.	6.	47.	0.89	0.13	0.35	21.6	1.60	165.2	0	9.7	1.55	131
GTRA16	22601	220.	0.	0.	-220.	15.	237.	6.	6.	0.69	0.13	0.13	10.2	0.76	158.0	-29	7.9	1.26	160
GTRA16	22601	427.	0.	0.	-427.	107.	545.	6.	44.	0.89	0.13	0.34	21.7	1.61	173.7	0	9.7	1.54	131
GTR208	22601	220.	0.	0.	-220.	15.	237.	6.	6.	0.68	0.13	0.13	9.6	0.71	148.7	-26	7.8	1.25	161
GTR208	22601	387.	0.	0.	-387.	89.	484.	6.	36.	0.76	0.13	0.32	17.1	1.26	150.3	0	9.0	1.44	134
GTR212	22601	220.	0.	0.	-220.	15.	237.	6.	6.	0.68	0.13	0.13	9.8	0.72	151.2	-27	7.8	1.25	161
GTR212	22601	403.	0.	0.	-403.	96.	506.	6.	39.	0.80	0.13	0.33	18.4	1.37	156.1	0	9.2	1.47	133
GTR216	22601	220.	0.	0.	-220.	15.	237.	6.	6.	0.68	0.13	0.13	9.9	0.73	153.7	-27	7.8	1.25	160
GTR216	22601	404.	0.	0.	-404.	98.	514.	6.	40.	0.83	0.13	0.34	19.6	1.45	165.3	0	9.3	1.48	132

REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTRW08	22601	226.	0.	0.	-226.	15.	237.	6.	6.	0.69	0.13	0.10	10.1	0.75	152.2	-31	8.0	1.28	158
GTRW08	22601	555.	0.	0.	-555.	140.	654.	6.	57.	0.96	0.13	0.30	23.2	1.72	142.5	0	11.5	1.84	128
GTRW12	22601	224.	0.	0.	-224.	15.	237.	6.	6.	0.69	0.13	0.11	10.1	0.75	153.3	-30	8.0	1.27	158
GTRW12	22601	545.	0.	0.	-545.	143.	663.	6.	58.	0.96	0.13	0.32	23.4	1.73	146.4	0	11.1	1.77	129
GTRW16	22601	224.	0.	0.	-224.	15.	237.	6.	6.	0.69	0.13	0.11	10.3	0.76	156.7	-32	8.0	1.28	158
GTRW16	22601	517.	0.	0.	-517.	133.	630.	6.	54.	0.95	0.13	0.32	23.2	1.72	153.4	0	10.9	1.74	129
GTR308	22601	228.	0.	0.	-228.	15.	237.	6.	6.	0.68	0.13	0.10	9.7	0.72	145.1	-29	8.0	1.28	158
GTR308	22601	480.	0.	0.	-480.	107.	544.	6.	44.	0.83	0.13	0.26	18.9	1.40	134.2	0	10.8	1.72	128
GTR312	22601	223.	0.	0.	-223.	15.	237.	6.	6.	0.68	0.13	0.11	9.8	0.72	149.3	-28	7.9	1.27	159
GTR312	22601	472.	0.	0.	-472.	116.	574.	6.	47.	0.85	0.13	0.32	19.7	1.46	142.1	0	10.1	1.62	130
GTR316	22601	224.	0.	0.	-224.	15.	237.	6.	6.	0.69	0.13	0.11	10.0	0.74	152.8	-29	8.0	1.27	159
GTR316	22601	469.	0.	0.	-469.	114.	568.	6.	47.	0.87	0.13	0.31	20.3	1.51	147.9	0	10.2	1.63	129
FCPADS	22601	230.	0.	0.	-230.	15.	237.	6.	6.	1.04	0.13	0.09	10.3	0.77	153.0	-40	8.5	1.36	157
FCPADS	22601	929.	0.	0.	-929.	254.	1036.	6.	104.	8.93	0.13	0.28	51.2	4.54	224.8	0	27.2	4.35	171
FCMCDS	22601	223.	0.	0.	-223.	15.	237.	6.	6.	1.01	0.13	0.11	10.5	0.79	162.0	-39	8.3	1.33	159
FCMCDS	22601	678.	0.	0.	-678.	201.	858.	6.	82.	6.75	0.13	0.36	52.6	3.90	264.5	0	20.3	3.23	155

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	24211	0.	4.	12.	0.	0.	0.		2.	0.	0.21	0.17	0.	1.8	1.00	174.4	0	0.6	1.00	80
STM141	24211	0.	0.	0.	0.	4.	12.		2.	2.	0.38	0.17	0.99	3.3	1.81	270.3	0	0.7	1.18	245
STM141	24211	0.	1.	0.	0.	3.	14.		2.	2.	0.30	0.17	0.95	3.1	1.70	248.5	5	0.6	1.00	225
STM141	24211	0.	0.	0.	0.	4.	12.	F	2.	2.	0.62	0.17	0.99	6.1	3.38	503.5	0	1.3	2.05	256
STM141	24211	0.	0.	1.	0.	4.	13.	F	2.	2.	0.49	0.17	0.95	5.5	3.02	441.9	0	1.1	1.70	232
STM141	24211	0.	0.	0.	0.	4.	12.	A	2.	2.	0.56	0.17	0.99	5.5	3.06	456.4	0	1.2	1.85	252
STM141	24211	0.	0.	1.	0.	4.	13.	A	2.	2.	0.42	0.17	0.95	4.8	2.65	386.8	0	0.9	1.48	229
STM088	24211	0.	1.	2.	0.	3.	10.		2.	1.	0.29	0.17	0.81	2.6	1.45	222.7	6	0.6	0.98	211
STM088	24211	0.	1.	2.	0.	3.	10.	F	2.	1.	0.47	0.17	0.81	5.0	2.76	422.4	0	1.1	1.68	216
STM088	24211	0.	1.	2.	0.	3.	10.	A	2.	1.	0.41	0.17	0.81	4.5	2.48	379.7	0	0.9	1.49	213
PFBSTM	24211	0.	0.	0.	0.	4.	12.		2.	2.	0.67	0.17	0.98	7.5	4.16	617.2	0	1.5	2.36	259
PFBSTM	24211	0.	0.	6.	0.	7.	17.		2.	3.	0.53	0.17	0.80	7.3	4.02	526.0	0	1.2	1.97	213
TISTMT	24211	0.	20.	0.	0.	-16.	12.		2.	2.	0.53	0.17	-0.26	8.4	4.64	688.3	0	1.7	2.75	113
TISTMT	24211	0.	0.	0.	0.	4.	12.		2.	2.	0.81	0.17	0.98	12.2	6.77	1004.1	0	2.1	3.40	281
TISTMT	24211	0.	0.	10.	0.	9.	21.		2.	4.	0.83	0.17	0.76	18.1	10.01	1209.2	0	2.6	4.22	250
TIHRSG	24211	0.	36.	0.	0.	-33.	12.		2.	2.	0.52	0.17	-1.27	11.0	6.12	859.0	0	2.2	3.52	3
TIHRSG	24211	0.	0.	3.	0.	4.	10.		2.	2.	0.78	0.17	0.83	15.0	8.33	1169.0	0	2.4	3.87	273
TIHRSG	24211	0.	0.	5.	0.	5.	11.		2.	2.	0.67	0.17	0.75	16.0	8.90	1186.8	0	2.4	3.84	250
STIRL	24211	20.	0.	0.	-20.	4.	12.		2.	2.	0.35	0.17	-0.25	2.9	1.62	225.1	0	1.0	1.62	103
STIRL	24211	0.	20.	0.	0.	-16.	12.		2.	2.	0.35	0.17	-0.25	2.9	1.62	225.2	0	1.0	1.52	100
STIRL	24211	0.	0.	3.	0.	4.	9.		2.	2.	0.61	0.17	0.81	6.3	3.51	489.0	0	1.3	2.08	234
STIRL	24211	0.	0.	22.	0.	12.	17.		2.	5.	0.50	0.17	0.56	6.7	3.71	360.7	0	1.1	1.74	167
HEGT85	24211	0.	0.	7.	0.	4.	5.	A	2.	2.	0.66	0.17	0.53	10.7	5.91	747.3	0	1.9	2.98	216
HEGT85	24211	0.	0.	177.	0.	50.	-8.	A	2.	20.	1.46	0.17	0.19	42.3	23.47	663.4	0	5.8	9.19	271
HEGT60	24211	0.	0.	7.	0.	4.	5.	A	2.	2.	0.65	0.17	0.57	10.3	5.73	734.2	0	1.8	2.90	219
HEGT60	24211	0.	0.	58.	0.	18.	4.	A	2.	8.	0.79	0.17	0.28	20.8	11.55	717.4	0	3.0	4.74	185
HEGT00	24211	0.	0.	6.	0.	4.	6.	A	2.	2.	0.62	0.17	0.60	9.7	5.36	693.3	0	1.7	2.73	219
HEGT00	24211	0.	0.	20.	0.	8.	6.	A	2.	3.	0.51	0.17	0.41	11.7	6.46	651.8	0	1.8	2.84	179
FCMCCL	24211	0.	0.	63.	0.	14.	-17.		2.	6.	0.65	0.17	-0.05	13.8	7.63	741.5	0	2.3	3.70	128
FCSTCL	24211	0.	0.	75.	0.	21.	-6.		2.	8.	0.83	0.17	0.16	16.5	9.13	746.3	0	2.7	4.22	156
IGGTST	24211	0.	0.	70.	0.	14.	-22.		2.	6.	0.75	0.17	-0.13	14.2	7.88	691.8	0	2.5	4.01	124
GTSOAR	24211	0.	18.	0.	0.	-14.	12.		2.	2.	0.34	0.17	-0.10	3.4	1.89	264.0	0	1.0	1.53	116
GTAC08	24211	0.	19.	0.	0.	-15.	12.		2.	2.	0.33	0.17	-0.19	3.1	1.71	245.8	0	0.9	1.49	107
GTAC12	24211	0.	17.	0.	0.	-13.	12.		2.	2.	0.33	0.17	-0.05	3.1	1.70	243.8	0	0.9	1.43	122
GTAC16	24211	0.	16.	0.	0.	-12.	12.		2.	2.	0.33	0.17	0.01	3.1	1.73	248.0	0	0.9	1.42	129
GTWC16	24211	0.	16.	0.	0.	-13.	12.		2.	2.	0.34	0.17	-0.02	3.3	1.85	259.6	0	0.9	1.48	126
CC1626	24211	0.	14.	0.	0.	-10.	12.		2.	2.	0.40	0.17	0.15	3.4	1.88	263.9	0	1.0	1.54	148
CC1622	24211	0.	14.	0.	0.	-10.	12.		2.	2.	0.40	0.17	0.14	3.2	1.80	254.0	0	0.9	1.51	146
CC1222	24211	0.	14.	0.	0.	-10.	12.		2.	2.	0.39	0.17	0.14	3.2	1.75	247.9	0	0.9	1.49	147
CC0822	24211	0.	15.	0.	0.	-11.	12.		2.	2.	0.40	0.17	0.08	3.3	1.82	261.4	0	1.0	1.54	140
STIG15	24211	0.	13.	0.	0.	-10.	12.		2.	2.	0.35	0.17	0.18	3.5	1.92	243.1	0	0.9	1.45	147
STIG10	24211	0.	14.	0.	0.	-11.	12.		2.	2.	0.35	0.17	0.11	3.3	1.84	239.5	0	0.9	1.44	141
STIG1S	24211	0.	15.	0.	0.	-12.	12.		2.	2.	0.35	0.17	0.05	3.3	1.81	238.8	0	0.9	1.45	133

REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
DEADV3	24211	0.	14.	0.	0.	-10.	12.	2.	2.	0.39	0.17	0.14	4.5	2.47	333.3	0	1.1	1.69	145
DEHTPM	24211	0.	15.	0.	0.	-12.	12.	2.	2.	0.41	0.17	0.04	4.5	2.50	358.3	0	1.1	1.76	134
DESOA3	24211	14.	0.	0.	-14.	4.	12.	2.	2.	0.36	0.17	0.11	3.4	1.89	249.8	0	1.0	1.55	144
DESOA3	24211	0.	14.	0.	0.	-10.	12.	2.	2.	0.36	0.17	0.11	3.4	1.89	249.8	0	0.9	1.48	142
GTSOAD	24211	18.	0.	0.	-18.	4.	12.	2.	2.	0.33	0.17	-0.10	3.0	1.66	236.4	0	1.0	1.53	119
GTRA08	24211	14.	0.	0.	-14.	4.	12.	2.	2.	0.34	0.17	0.10	3.5	1.95	274.0	0	1.0	1.54	142
GTRA12	24211	14.	0.	0.	-14.	4.	12.	2.	2.	0.34	0.17	0.11	3.4	1.90	268.3	0	1.0	1.52	142
GTRA16	24211	15.	0.	0.	-15.	4.	12.	2.	2.	0.34	0.17	0.08	3.5	1.96	276.0	0	1.0	1.55	139
GTR208	24211	16.	0.	0.	-16.	4.	12.	2.	2.	0.34	0.17	0.00	3.3	1.85	260.2	0	1.0	1.55	130
GTR212	24211	16.	0.	0.	-16.	4.	12.	2.	2.	0.34	0.17	0.03	3.4	1.88	264.8	0	1.0	1.55	133
GTR216	24211	15.	0.	0.	-15.	4.	12.	2.	2.	0.34	0.17	0.05	3.4	1.89	267.7	0	1.0	1.56	136
GTRW08	24211	15.	0.	0.	-15.	4.	12.	2.	2.	0.35	0.17	0.09	3.6	1.98	271.1	0	1.0	1.57	140
GTRW12	24211	14.	0.	0.	-14.	4.	12.	2.	2.	0.35	0.17	0.12	3.6	1.98	273.6	0	1.0	1.55	144
GTRW16	24211	14.	0.	0.	-14.	4.	12.	2.	2.	0.35	0.17	0.10	3.7	2.03	280.5	0	1.0	1.57	142
GTR308	24211	17.	0.	0.	-17.	4.	12.	2.	2.	0.34	0.17	-0.03	3.4	1.86	252.3	0	1.0	1.58	126
GTR312	24211	15.	0.	0.	-15.	4.	12.	2.	2.	0.34	0.17	0.06	3.5	1.91	265.4	0	1.0	1.55	137
GTR316	24211	15.	0.	0.	-15.	4.	12.	2.	2.	0.34	0.17	0.06	3.5	1.97	272.3	0	1.0	1.57	136
FCPADS	24211	13.	0.	0.	-13.	4.	12.	2.	2.	0.35	0.17	0.16	3.2	1.75	234.5	0	0.9	1.48	149
FCMCDS	24211	12.	0.	0.	-12.	4.	12.	2.	2.	0.35	0.17	0.22	3.2	1.78	247.4	0	0.9	1.45	156

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NCCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	24361	0.	7.	25.	0.	0.	0. A	3.	0.	0.58	0.14	0.	6.5	1.00	252.8	0	2.0	1.00	80
STM141	24361	0.	0.	0.	0.	7.	25.	3.	3.	0.51	0.14	0.99	5.3	0.81	161.0	999	1.1	0.55	248
STM141	24361	0.	1.	0.	0.	7.	26.	3.	3.	0.42	0.14	0.97	5.0	0.77	159.8	999	1.0	0.49	235
STM141	24361	0.	0.	0.	0.	7.	24. F	3.	3.	0.88	0.14	0.99	10.5	1.61	357.8	4	2.0	1.02	243
STM141	24361	0.	0.	1.	0.	8.	25. F	3.	3.	0.73	0.14	0.97	9.7	1.48	327.2	10	1.8	0.89	229
STM141	24361	0.	0.	0.	0.	7.	24. A	3.	3.	0.79	0.14	0.99	8.7	1.34	297.4	12	1.7	0.88	244
STM141	24361	0.	0.	1.	0.	8.	25. A	3.	3.	0.64	0.14	0.97	7.8	1.19	263.4	27	1.5	0.74	230
STM038	24361	0.	2.	8.	0.	5.	17.	3.	2.	0.40	0.14	0.68	4.3	0.66	153.3	999	1.1	0.55	202
STM038	24361	0.	2.	8.	0.	5.	17. F	3.	2.	0.70	0.14	0.68	8.8	1.35	313.3	8	1.9	0.95	194
STM038	24361	0.	2.	8.	0.	5.	17. A	3.	2.	0.61	0.14	0.68	7.3	1.12	258.3	30	1.6	0.82	195
PFBSTM	24361	0.	0.	1.	0.	7.	24.	3.	3.	1.03	0.14	0.97	12.9	1.98	437.1	0	2.4	1.23	242
PFBSTM	24361	0.	0.	13.	0.	15.	35.	3.	6.	0.88	0.14	0.79	12.4	1.90	374.3	5	2.0	1.00	198
TISTMT	24361	0.	45.	0.	0.	-37.	25.	3.	3.	0.79	0.14	-0.40	14.8	2.27	503.2	0	3.4	1.70	80
TISTMT	24361	0.	0.	1.	0.	7.	24.	3.	3.	1.24	0.14	0.98	21.9	3.35	742.4	0	3.6	1.83	249
TISTMT	24361	0.	0.	22.	0.	20.	45.	3.	8.	1.37	0.14	0.75	34.0	5.20	949.4	0	4.6	2.33	204
TIHRSG	24361	0.	0.	7.	0.	7.	18.	3.	3.	1.27	0.14	0.78	26.5	4.05	844.5	0	4.2	2.13	230
TIHRSG	24361	0.	0.	19.	0.	12.	21.	3.	5.	1.21	0.14	0.64	32.1	4.91	922.3	0	4.7	2.35	202
STIRL	24361	42.	0.	0.	-42.	7.	25.	3.	3.	0.52	0.14	-0.32	5.6	0.86	180.8	-20	2.2	1.13	97
STIRL	24361	0.	42.	0.	0.	-35.	25.	3.	3.	0.52	0.14	-0.32	5.6	0.86	180.9	-9	2.0	1.03	94
STIRL	24361	0.	0.	6.	0.	7.	18.	3.	3.	0.93	0.14	0.80	11.7	1.79	376.0	0	2.2	1.13	220
STIRL	24361	0.	0.	54.	0.	27.	36.	3.	11.	0.89	0.14	0.54	15.4	2.35	340.5	4	2.1	1.08	150
HEGT60	24361	0.	0.	16.	0.	7.	9. A	3.	3.	1.00	0.14	0.50	17.8	2.72	522.5	0	3.1	1.58	186
HEGT60	24361	0.	0.	200.	0.	56.	-13. A	3.	23.	1.68	0.14	0.18	45.4	6.94	516.6	0	6.4	3.22	130
HEGT00	24361	0.	0.	14.	0.	7.	11. A	3.	3.	0.97	0.14	0.58	16.8	2.57	505.5	0	3.0	1.50	194
HEGT00	24361	0.	0.	56.	0.	20.	10. A	3.	8.	0.94	0.14	0.34	22.6	3.46	493.7	0	3.4	1.72	144
FCMCCL	24361	0.	0.	159.	0.	35.	-43.	3.	14.	1.26	0.14	-0.05	26.3	4.03	565.6	0	4.6	2.34	94
FCSTCL	24361	0.	0.	181.	0.	47.	-22.	3.	19.	1.51	0.14	0.12	30.3	4.63	571.9	0	4.9	2.47	110
IGGTST	24361	0.	0.	168.	0.	32.	-61.	3.	13.	1.14	0.14	-0.21	25.0	3.83	506.2	0	4.7	2.35	77
GTSOAR	24361	0.	35.	0.	0.	-28.	25.	3.	3.	0.49	0.14	-0.10	6.0	0.92	192.5	999	1.9	0.96	118
GTAC08	24361	0.	38.	0.	0.	-31.	25.	3.	3.	0.48	0.14	-0.19	5.5	0.85	183.6	999	1.9	0.96	110
GTAC12	24361	0.	34.	0.	0.	-26.	25.	3.	3.	0.48	0.14	-0.05	5.5	0.85	182.4	999	1.8	0.91	126
GTAC16	24361	0.	32.	0.	0.	-24.	25.	3.	3.	0.48	0.14	0.01	5.6	0.86	185.1	999	1.8	0.89	132
GTWC16	24361	0.	32.	0.	0.	-25.	25.	3.	3.	0.49	0.14	-0.02	5.9	0.90	191.3	999	1.8	0.92	129
CC1626	24361	0.	28.	0.	0.	-21.	25.	3.	3.	0.56	0.14	0.12	5.9	0.90	189.4	999	1.8	0.91	145
CC1622	24361	0.	29.	0.	0.	-21.	25.	3.	3.	0.55	0.14	0.10	5.7	0.87	184.1	999	1.8	0.90	144
CC1222	24361	0.	29.	0.	0.	-21.	25.	3.	3.	0.55	0.14	0.10	5.5	0.85	180.0	999	1.8	0.90	145
CC0822	24361	0.	31.	0.	0.	-24.	25.	3.	3.	0.55	0.14	0.03	5.7	0.87	187.3	999	1.8	0.93	136
STIG15	24361	0.	27.	0.	0.	-20.	25.	3.	3.	0.51	0.14	0.16	5.9	0.90	175.4	999	1.7	0.87	149
STIG10	24361	0.	29.	0.	0.	-21.	25.	3.	3.	0.50	0.14	0.11	5.7	0.87	173.2	999	1.7	0.87	144
STIG1S	24361	0.	31.	0.	0.	-23.	25.	3.	3.	0.50	0.14	0.05	5.6	0.86	172.8	999	1.8	0.88	137
DEADV3	24361	0.	28.	0.	0.	-20.	25.	3.	3.	0.55	0.14	0.14	7.5	1.15	234.3	7	2.0	0.98	143
DEHTPM	24361	0.	33.	0.	0.	-26.	25.	3.	3.	0.59	0.14	-0.03	7.8	1.19	253.3	0	2.1	1.07	124
DESOA3	24361	28.	0.	0.	-28.	7.	25.	3.	3.	0.53	0.14	0.11	6.5	0.99	198.4	-2	2.0	1.00	144

		-----------FUFL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
DESOA3	24361	0.	28.	0.	0.	-21.	25.	3.	3.	0.53	0.14	0.11	6.5	0.99	196.4	999	1.8	0.93	143
GTSOAD	24361	35.	0.	0.	-35.	7.	25.	3.	3.	0.48	0.14	-0.10	5.4	0.83	176.5	-5	2.0	1.00	123
GTRA08	24361	29.	0.	0.	-29.	7.	25.	3.	3.	0.49	0.14	0.10	6.1	0.94	197.1	999	1.9	0.96	144
GTRA12	24361	29.	0.	0.	-29.	7.	25.	3.	3.	0.49	0.14	0.11	6.1	0.93	195.7	999	1.9	0.96	144
GTRA16	24361	29.	0.	0.	-29.	7.	25.	3.	3.	0.49	0.14	0.08	6.2	0.96	201.2	999	1.9	0.96	141
GTR208	24361	32.	0.	0.	-32.	7.	25.	3.	3.	0.49	0.14	-0.00	5.9	0.90	190.4	-3	2.0	0.99	133
GTR212	24361	31.	0.	0.	-31.	7.	25.	3.	3.	0.49	0.14	0.03	6.0	0.92	193.5	-1	2.0	0.99	136
GTR216	24351	30.	0.	0.	-30.	7.	25.	3.	3.	0.49	0.14	0.05	6.0	0.92	196.0	999	1.9	0.96	138
GTRW08	24361	29.	0.	0.	-29.	7.	25.	3.	3.	0.50	0.14	0.09	6.2	0.96	195.9	999	1.9	0.96	142
GTRW12	24361	28.	0.	0.	-28.	7.	25.	3.	3.	0.49	0.14	0.12	6.2	0.96	197.7	999	1.9	0.96	146
GTRW16	24361	29.	0.	0.	-29.	7.	25.	3.	3.	0.50	0.14	0.10	6.4	0.97	202.4	999	1.9	0.96	143
GTR308	24361	33.	0.	0.	-33.	7.	25.	3.	3.	0.49	0.14	-0.03	5.9	0.91	185.3	-7	2.0	1.01	129
GTR312	24361	30.	0.	0.	-30.	7.	25.	3.	[illegible]	0.49	0.14	0.06	6.0	0.92	193.1	999	1.9	0.97	140
GTR316	24361	30.	0.	0.	-30.	7.	25.	3.	[illegible]	0.50	0.14	0.06	6.2	0.96	197.7	0	2.0	0.99	138
FCPADS	24361	27.	0.	0.	-27.	7.	25.	3.	3.	0.62	0.14	0.16	5.9	0.90	183.3	-3	2.0	0.99	152
FCMCDS	24361	25.	0.	0.	-25.	7.	25.	3.	3.	0.61	0.14	0.22	6.0	0.93	193.0	999	1.9	0.96	158

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTJ*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WITH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	24921	0.	12.	43.	0.	0.	0.	A	5.	0.	0.44	0.46	0.	4.4	1.00	341.9	0	2.5	1.00	80
STM141	24921	0.	17.	28.	0.	-5.	15.		5.	2.	0.32	0.46	0.19	3.3	0.75	223.3	999	2.0	0.80	137
STM141	24921	0.	8.	37.	0.	4.	7.	F	5.	2.	0.54	0.46	0.19	6.0	1.37	409.3	9	2.4	0.96	126
STM141	24921	0.	8.	37.	0.	4.	7.	A	5.	2.	0.47	0.46	0.19	5.1	1.18	351.5	24	2.2	0.90	128
STM088	24921	0.	16.	33.	0.	-4.	11.		5.	1.	0.31	0.46	0.12	2.8	0.64	199.4	999	2.0	0.81	129
STM038	24921	0.	10.	39.	0.	2.	4.	F	5.	1.	0.52	0.46	0.12	5.4	1.25	390.7	[illegible]	2.4	0.98	115
STM088	24921	0.	10.	39.	0.	2.	4.	A	5.	1.	0.46	0.46	0.12	4.8	1.10	344.5	20	2.3	0.93	117
PFLSTM	24921	0.	5.	32.	0.	7.	12.		5.	3.	0.63	0.46	0.34	7.9	1.82	484.9	7	2.4	0.96	144
TISTHT	24921	0.	15.	39.	0.	-3.	4.		5.	0.	0.37	0.46	0.03	3.7	0.85	284.3	999	2.3	0.94	99
TISTHT	24921	0.	2.	27.	0.	10.	16.		5.	4.	0.92	0.46	0.47	20.3	4.65	1147.6	0	3.7	1.50	182
TIHRSG	24921	0.	15.	40.	0.	-3.	3.		5.	0.	0.32	0.46	0.01	3.6	0.82	273.8	999	2.3	0.92	95
TIHRSG	24921	0.	6.	39.	0.	6.	5.		5.	2.	0.79	0.46	0.19	19.1	4.38	1113.1	0	3.9	1.59	127
STIRL	24921	70.	0.	0.	-70.	12.	43.		5.	5.	0.41	0.46	-0.27	4.6	1.06	211.9	0	3.4	1.37	106
STIRL	24921	4.	12.	39.	-4.	1.	5.		5.	0.	0.32	0.46	0.02	2.8	0.63	207.4	999	2.2	0.89	108
STIRL	24921	0.	70.	0.	0.	-58.	43.		5.	5.	0.41	0.46	-0.27	4.6	1.06	212.1	0	2.9	1.18	100
STIRL	24921	0.	16.	39.	0.	-3.	5.		5.	0.	0.32	0.46	0.02	2.8	0.63	207.3	999	2.2	0.87	107
STIRL	24921	0.	0.	32.	0.	12.	11.		5.	5.	0.70	0.46	0.42	8.2	1.88	379.9	12	2.1	0.85	164
STIRL	24921	0.	0.	33.	0.	13.	12.		5.	5.	0.58	0.46	0.42	7.7	1.77	347.4	16	1.9	0.77	153
HEGT60	24921	0.	0.	49.	0.	12.	-5.	A	5.	5.	0.97	0.46	0.12	18.9	4.33	716.1	0	3.8	1.54	132
HEGT60	24921	0.	0.	107.	0.	28.	-12.	A	5.	11.	1.09	0.46	0.13	27.6	6.33	636.9	0	4.7	1.90	119
HEGT00	24921	0.	2.	44.	0.	10.	-1.	A	5.	4.	0.62	0.46	0.16	13.8	3.15	608.1	0	3.0	1.22	121
FCMCCL	24921	0.	0.	68.	0.	12.	-25.		5.	5.	0.92	0.46	-0.23	14.9	3.42	744.3	0	3.7	1.50	89
FCMCCL	24921	0.	0.	78.	0.	17.	-19.		5.	7.	0.83	0.46	-0.02	16.0	3.66	696.0	0	3.6	1.43	101
FCSTCL	24921	0.	0.	68.	0.	12.	-24.		5.	5.	1.00	0.46	-0.21	14.9	3.43	755.4	0	3.8	1.53	92
FCSTCL	24921	0.	0.	89.	0.	23.	-9.		5.	10.	1.02	0.46	0.14	18.4	4.21	703.4	0	3.7	1.50	118
IGGTST	24921	0.	0.	74.	0.	12.	-31.		5.	5.	0.94	0.46	-0.33	15.2	3.49	699.8	0	3.9	1.56	78
IGGTST	24921	0.	0.	83.	0.	16.	-28.		5.	6.	0.81	0.46	-0.17	15.7	3.60	646.5	0	3.7	1.48	84
GTSOAR	24921	0.	59.	0.	0.	-47.	43.		5.	5.	0.43	0.46	-0.06	5.4	1.23	247.6	0	2.7	1.09	120
GTSOAR	24921	0.	16.	38.	0.	-4.	6.		5.	0.	0.31	0.46	0.03	3.0	0.68	219.5	999	2.2	0.88	109
GTAC08	24921	0.	63.	0.	0.	-51.	43.		5.	5.	0.37	0.46	-0.14	4.5	1.03	223.8	0	2.7	1.06	115
GTAC08	24921	0.	15.	39.	0.	-3.	5.		5.	0.	0.30	0.46	0.03	2.7	0.63	206.6	999	2.1	0.86	109
GTAC12	24921	0.	56.	0.	0.	-44.	43.		5.	5.	0.40	0.46	-0.00	4.7	1.08	233.3	0	2.5	1.02	128
GTAC12	24921	0.	16.	38.	0.	-3.	6.		5.	0.	0.31	0.46	0.04	2.8	0.63	207.0	999	2.1	0.86	111
GTAC16	24921	0.	53.	0.	0.	-41.	43.		5.	5.	0.41	0.46	0.05	5.0	1.14	242.8	7	2.5	1.00	133
GTAC16	24921	0.	16.	37.	0.	-4.	6.		5.	0.	0.31	0.46	0.04	2.8	0.65	209.6	999	2.1	0.86	112
GTWC16	24921	0.	54.	0.	0.	-42.	43.		5.	5.	0.43	0.46	0.03	5.3	1.21	250.3	0	2.6	1.03	130
GTWC16	24921	0.	16.	37.	0.	-4.	6.		5.	0.	0.31	0.46	0.04	2.9	0.67	217.7	999	2.2	0.87	111
CC1626	24921	0.	47.	0.	0.	-35.	43.		5.	5.	0.52	0.46	0.15	5.4	1.25	255.3	6	2.5	1.00	144
CC1626	24921	0.	17.	36.	0.	-5.	8.		5.	1.	0.37	0.46	0.06	3.1	0.70	220.4	999	2.2	0.89	118
CC1622	24921	0.	48.	0.	0.	-36.	43.		5.	5.	0.51	0.46	0.14	5.2	1.18	245.8	7	2.5	0.99	143
CC1622	24921	0.	16.	36.	0.	-4.	7.		5.	1.	0.37	0.46	0.06	2.9	0.67	212.6	999	2.2	0.89	116
CC1222	24921	0.	48.	0.	0.	-36.	43.		5.	5.	0.50	0.46	0.14	5.0	1.14	238.8	11	2.4	0.96	144
CC1222	24921	0.	16.	36.	0.	-4.	7.		5.	1.	0.37	0.46	0.06	2.9	0.65	208.5	999	2.2	0.88	116

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------	FUEL USE IN BTU*10**6	-----------															
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
CC0822	24921	0.	51.	0.	0.	-39.	43.	5.	5.	0.50	0.46	0.08	5.1	1.16	249.3	0	2.5	1.02	136
CC0822	24921	0.	16.	37.	0.	-4.	6.	5.	0.	0.36	0.46	0.05	2.9	0.65	212.2	999	2.2	0.89	113
STIG15	24921	0.	46.	0.	0.	-34.	43.	5.	5.	0.51	0.46	0.17	5.6	1.29	219.6	7	2.5	0.99	144
STIG15	24921	0.	154	0.	0.	-112.	143.	5.	17.	0.81	0.46	0.17	10.4	2.39	182.2	0	4.1	1.66	121
STIG10	24921	0.	48.	0.	0.	-35.	43.	5.	5.	0.48	0.46	0.15	5.3	1.22	216.3	10	2.4	0.97	143
STIG10	24921	0	23	28.	0.	-11.	15.	5.	2.	0.37	0.46	0.08	3.7	0.84	221.7	999	2.2	0.90	123
STIG1S	24921	0.	51.	0.	0.	-39.	43.	5.	5.	0.47	0.46	0.09	5.1	1.18	214.6	4	2.5	1.00	137
STIG1S	24921	0.	19.	33.	0.	-7.	10.	5.	1.	0.34	0.46	0.05	3.2	0.74	216.2	999	2.2	0.89	117
DEADV3	24921	0.	46.	0.	0.	-34.	43.	5.	5.	0.53	0.46	0.17	7.2	1.66	311.6	0	2.6	1.06	141
DEADV3	24921	0.	20.	32.	0.	-6.	12.	5.	1.	0.39	0.46	0.07	4.5	1.03	290.0	999	2.4	0.95	115
DEHTPM	24921	0.	55.	0.	0.	-43.	43.	5.	5.	0.54	0.46	0.01	7.3	1.67	350.9	0	2.9	1.17	124
DEHTPM	24921	0.	16.	38.	0.	-4.	6.	5.	0.	0.34	0.46	0.04	2.9	0.67	218.2	999	2.2	0.88	111
DESOA3	24921	47.	0.	0.	-47.	12.	43.	5.	5.	0.51	0.46	0.15	6.5	1.50	270.7	0	2.9	1.16	143
DESOA3	24921	13.	9.	30.	-13.	3.	14.	5.	1.	0.38	0.46	0.07	3.6	0.84	230.0	999	2.3	0.94	122
DESOA3	24921	0.	47.	0.	0.	-35.	43.	5.	5.	0.51	0.46	0.15	6.5	1.50	270.7	0	2.6	1.04	140
DESOA3	24921	0.	22.	30.	0.	-10.	14.	5.	1.	0.38	0.46	0.07	3.6	0.84	230.0	999	2.3	0.91	121
GTSOAD	24921	58.	0.	0.	-58.	12.	43.	5.	5.	0.40	0.46	-0.05	4.5	1.03	216.7	0	3.0	1.19	128
GTSOAD	24921	4.	11.	38.	-4.	1.	5.	5.	0.	0.30	0.46	0.04	2.7	0.63	205.2	999	2.2	0.87	111
GTRA08	24921	45.	0.	0.	-48.	12.	43.	5.	5.	0.45	0.43	0.14	5.7	1.31	265.5	0	2.8	1.11	144
GTRA08	24921	6.	11.	36.	-6.	2.	8.	5.	1.	0.33	0.46	0.06	3.2	0.74	232.4	999	2.2	0.90	114
GTRA12	24921	48.	0.	0.	-48.	12.	43.	5	5.	0.44	0.46	0.14	5.6	1.29	265.4	0	2.7	1.10	144
GTRA12	24921	6.	11.	36.	-6.	2.	8.	5.	1.	0.32	0.46	0.06	3.1	0.72	226.8	999	2.2	0.89	115
GTRA16	24921	49.	0.	0.	-49.	12.	43.	5.	5.	0.45	0.46	0.12	5.9	1.34	276.2	0	2.8	1.13	141
GTRA16	24921	6.	11.	36.	-6.	1.	7.	5.	1.	0.32	0.46	0.05	3.1	0.72	229.1	999	2.2	0.89	113
GTR208	24921	53.	0.	0.	-53.	12.	43.	5.	5.	0.43	0.46	0.04	5.3	1.21	249.5	0	2.9	1.16	135
GTR208	24921	5.	11.	37.	-5.	1.	6.	5.	0.	0.31	0.46	0.04	3.0	0.68	219.2	999	2.2	0.89	112
GTR212	24921	52.	0.	0.	-52.	12.	43.	5.	5.	0.43	0.46	0.07	5.5	1.25	257.4	0	2.9	1.10	137
GTR212	24921	5.	11.	37.	-5.	1.	7.	5.	1.	0.32	0.46	0.05	3.0	0.69	222.2	999	2.2	0.89	112
GTR216	24921	51.	0.	0.	-51.	12.	43.	5.	5.	0.44	0.48	0.09	5.6	1.28	264.5	0	2.8	1.14	139
GTR216	24921	5.	11.	37.	-5.	1.	7.	5.	1.	0.32	0.46	0.05	3.0	0.70	223.3	999	2.2	0.89	113
GTRW08	24921	49.	0.	0.	-49.	12.	43.	5.	5.	0.46	0.46	0.13	5.9	1.34	259.4	0	2.8	1.13	142
GTRW08	24921	8.	10.	35.	-8.	2.	9.	5.	1.	0.34	0.46	0.06	3.4	0.77	235.5	999	2.3	0.91	115
GTRW12	24921	47.	0.	0.	-47.	12.	43.	5.	5.	0.45	0.46	0.16	5.9	1.34	264.9	0	2.7	1.10	145
GTRW12	24921	7.	10.	35.	-7.	2.	9.	5.	1.	0.33	0.46	0.06	3.4	0.77	236.9	999	2.3	0.90	116
GTRW16	24921	48.	0.	0.	-48.	12.	43.	5.	5.	0.46	0.46	0.14	6.0	1.38	274.0	0	2.8	1.12	143
GTRW16	24921	7.	11.	35.	-7.	2.	8.	5.	1.	0.33	0.46	0.06	3.4	0.77	239.0	999	2.3	0.90	114
GTR308	24921	55.	0.	0.	-55.	12.	43.	5.	5.	0.44	0.46	0.01	5.4	1.25	235.9	0	3.0	1.20	131
GTR308	24921	7.	11.	36.	-7.	1.	7.	5.	[illegible]	0.32	0.46	0.04	3.1	0.70	218.8	999	2.2	0.90	113
GTR312	24921	50.	0.	0.	-50.	12.	43.	5.	[illegible]	0.44	0.46	0.10	5.5	1.27	254.6	0	2.8	1.13	140
GTR312	24921	6.	11.	36.	-6.	2.	7.	5.	1.	0.32	0.46	0.05	3.2	0.72	227.6	999	2.2	0.89	114
GTR316	24921	50.	0.	0.	-50.	12.	43.	5.	5.	0.45	0.46	0.10	5.7	1.32	263.3	0	2.8	1.14	139
GTR316	24921	6.	11.	36.	-6.	1.	7.	5.	1.	0.32	0.46	0.05	3.2	0.73	231.0	999	2.2	0.90	113
FCPADS	24921	45.	0.	0.	-45.	12.	43.	5.	5.	0.82	0.46	0.19	5.5	1.25	234.3	0	3.0	1.20	154
FCPADS	24921	12.	9.	30.	-12.	3.	13.	5.	1.	0.42	0.46	0.08	3.4	0.78	218.1	999	2.3	0.94	124

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
FCMCDS	24921	41.	0.	0.	-41.	2.	43.	5.	5.	0.78	0.46	0.26	5.6	1.29	260.9	0	2.9	1.15	160
FCMCDS	24921	9.	10.	33.	-9.	3.	11.	5.	1.	0.38	0.46	0.09	3.3	0.75	223.0	999	2.2	0.90	123

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	C&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	26212	0.	123.	975.	0.	0.	0.	F	50.	0.	2.51	0.22	0.	47.9	1.00	178.0	0	33.9	1.00	80
STM141	26212	0.	761.	23.	0.	-638.	952.		50.	47.	1.41	0.22	0.29	32.3	0.67	99.5	999	28.9	0.65	162
STM141	26212	0.	7.	777.	0.	116.	198.	F	50.	47.	3.20	0.22	0.29	61.3	1.28	188.9	42	24.1	0.71	142
STM141	26212	0.	7.	777.	0.	116.	198.	A	50.	47.	2.93	0.22	0.29	42.6	0.89	131.4	999	21.8	0.64	149
STM088	26212	0.	741.	129.	0.	-618.	846.		50.	34.	1.24	0.22	0.21	25.6	0.54	82.9	999	30.6	0.90	158
STM088	26212	0.	39.	831.	0.	84.	144.	F	50.	34.	2.99	0.22	0.21	57.3	1.20	185.5	43	26.7	0.79	134
STM088	26212	0.	39.	831.	0.	84.	144.	A	50.	34.	2.83	0.22	0.21	41.0	0.86	132.7	999	24.8	0.73	141
PFBSTM	26212	0.	0.	772.	0.	123.	203.		50.	50.	4.84	0.22	0.30	63.2	1.32	191.5	34	25.4	0.75	154
PFBSTM	26212	0.	0.	883.	0.	188.	311.		50.	77.	5.13	0.22	0.36	60.9	1.27	168.3	49	22.2	0.66	148
TISTMT	26212	0.	771.	0.	0.	-648.	975.		50.	50.	3.57	0.22	0.30	105.8	2.21	321.3	0	38.6	1.14	153
TISTMT	26212	0.	824.	0.	0.	-670.	1082.		50.	63.	3.90	0.22	0.33	118.8	2.48	344.3	0	39.4	1.16	145
TISTMT	26212	0.	0.	771.	0.	123.	204.		50.	50.	5.58	0.22	0.30	140.2	2.93	425.9	4	34.4	1.02	146
TISTMT	26212	0.	0.	987.	0.	251.	418.		50.	102.	6.85	0.22	0.40	202.1	4.22	514.9	4	36.1	1.06	138
TIHRSG	26212	0.	791.	159.	0.	-668.	816.		50.	31.	3.40	0.22	0.14	105.5	2.20	328.3	0	43.5	1.28	124
TIHRSG	26212	0.	0.	856.	0.	122.	119.		50.	50.	6.06	0.22	0.22	179.8	3.75	507.9	0	40.7	1.20	126
STIRL	26212	862.	0.	0.	-862.	123.	975.		50.	50.	2.22	0.22	0.22	53.6	1.12	150.7	0	40.2	1.19	159
STIRL	26212	1006.	0.	0.	-1006.	182.	1175.		50.	74.	2.48	0.22	0.26	63.2	1.32	158.7	0	42.1	1.24	149
STIRL	26212	0.	862.	0.	0.	-739.	975.		50.	50.	2.22	0.22	0.22	53.7	1.12	150.8	0	34.2	1.01	154
STIRL	26212	0.	1006.	0.	0.	-824.	1175.		50.	74.	2.48	0.22	0.26	63.3	1.32	158.9	0	35.2	1.04	144
STIRL	26212	0.	0.	862.	0.	123.	113.		50.	50.	4.41	0.22	0.22	91.5	1.91	256.9	12	29.4	0.87	139
STIRL	26212	0.	0.	1282.	0.	296.	274.		50.	121.	5.79	0.22	0.31	150.0	3.13	313.1	7	30.7	0.90	123
HEGT85	26212	0.	0.	1022.	0.	123.	-47.	A	50.	50.	5.20	0.22	0.07	120.7	2.52	299.4	2	36.4	1.07	121
HEGT85	26212	0.	0.	6244.	0.	1522.	-584.	A	50.	621.	23.87	0.22	0.13	652.2	13.62	337.3	0	94.5	2.79	106
HEGT60	26212	0.	0.	998.	0.	123.	-23.	A	50.	50.	5.08	0.22	0.09	115.1	2.40	290.8	3	35.2	1.04	123
HEGT60	26212	0.	0.	2331.	0.	500.	-94.	A	50.	204.	8.72	0.22	0.15	213.3	4.45	271.2	0	43.3	1.28	95
HEGT00	26212	0.	0.	977.	0.	123.	-2.	A	50.	50.	4.76	0.22	0.11	100.7	2.10	258.3	6	33.0	0.97	127
HEGT00	26212	0.	0.	1244.	0.	202.	-3.	A	50.	82.	5.11	0.22	0.14	117.0	2.44	250.1	5	33.6	0.99	114
FCMCCL	26212	0.	0.	1166.	0.	123.	-191.		50.	50.	5.35	0.22	-0.06	96.8	2.02	283.2	0	36.8	1.09	109
FCMCCL	26212	0.	0.	1648.	0.	360.	122.		50.	147.	8.45	0.22	0.23	142.4	2.98	295.0	4	34.7	1.02	112
FCSTCL	26212	0.	0.	1155.	0.	123.	-160.		50.	50.	5.37	0.22	-0.05	101.8	2.13	300.7	0	37.1	1.10	109
FCSTCL	26212	0.	0.	1978.	0.	547.	418.		50.	223.	10.26	0.22	0.33	172.5	3.60	297.6	7	30.9	0.91	108
IGGTST	26212	0.	0.	1216.	0.	123.	-241.		50.	50.	4.02	0.22	-0.11	89.1	1.86	249.9	1	35.5	1.05	104
IGGTST	26212	0.	0.	1843.	0.	380.	-6.		50.	155.	4.50	0.22	0.17	137.8	2.88	255.1	6	32.1	0.95	102
GTSOAR	26212	0.	860.	0.	0.	-737.	975.		50.	50.	1.79	0.22	0.22	39.9	0.83	112.3	999	32.3	0.95	161
GTSOAR	26212	0.	1132.	0.	0.	-896.	1355.		50.	96.	2.04	0.22	0.29	48.3	1.01	110.9	999	32.8	0.97	149
GTAC08	26212	0.	814.	0.	0.	-691.	975.		50.	50.	1.71	0.22	0.26	37.1	0.77	108.5	999	30.5	0.90	167
GTAC08	26212	0.	933.	0.	0.	-752.	1171.		50.	74.	1.80	0.22	0.31	40.1	0.84	106.5	999	29.9	0.88	158
GTAC12	26212	0.	819.	0.	0.	-696.	975.		50.	50.	1.75	0.22	0.25	38.5	0.80	112.2	999	30.8	0.91	165
GTAC12	26212	0.	1034.	0.	0.	-807.	1324.		50.	92.	1.96	0.22	0.33	45.9	0.96	113.0	999	30.2	0.89	155
GTAC16	26212	0.	824.	0.	0.	-702.	975.		50.	50.	1.78	0.22	0.25	39.9	0.83	115.7	999	31.2	0.92	164
GTAC16	26212	0.	1110.	0.	0.	-852.	1427.		50.	105.	2.10	0.22	0.34	50.9	1.06	118.8	87	30.7	0.91	152
GTWC16	26212	0.	848.	0.	0.	-726.	975.		50.	50.	1.77	0.22	0.23	39.1	0.82	111.0	999	31.8	0.94	162
GTWC16	26212	0.	1186.	0.	0.	-918.	1464.		50.	110.	2.05	0.22	0.32	48.6	1.02	107.8	999	31.9	0.94	150

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
CC1626	26212	0.	851.	0.	0.	-729.	975.	50.	50.	1.98	0.22	0.22	42.9	0.90	121.5	999	32.6	0.96	160
CC1626	26212	0.	1555.	0.	0.	-1132.	1983.	50.	173.	2.58	0.22	0.35	61.3	1.28	109.6	10	32.9	0.97	139
CC1622	26212	0.	839.	0.	0.	-717.	975.	50.	50	1.98	0.22	0.24	43.4	0.91	124.1	999	32.3	0.95	161
CC1622	26212	0.	1418.	0.	0.	-1037.	1841.	50.	155.	2.55	0.22	0.36	62.5	1.31	120.4	12	32.2	0.95	142
CC1222	26212	0.	837.	0.	0.	-714.	975.	50.	50.	1.96	0.22	0.24	42.3	0.88	121.5	999	32.1	0.95	162
CC1222	26212	0.	1407.	0.	0.	-1027.	1634.	50.	155.	2.51	0.22	0.36	59.5	1.24	115.4	17	31.6	0.93	143
CC0822	26212	0.	818.	0.	0.	-696.	975.	50.	50.	1.86	0.22	0.25	38.4	0.80	111.9	999	31.0	0.92	166
CC0822	26212	0.	1189.	0.	0.	-887.	1575.	50.	123.	2.26	0.22	0.37	51.0	1.07	112.9	66	29.9	0.88	151
STIG15	26212	0	1006.	0.	0.	-883.	975.	50.	50.	2.32	0.22	0.08	43.7	0.91	109.8	-42	37.7	1.11	146
STIG15	26212	0.	36923.	0.	0.	-26812.	34415.	50.	4123.	62.10	0.22	0.17	1012.1	21.14	92.7	0	507.1	14.97	413
STIG10	26212	0.	966.	0.	0.	-843.	975.	50.	50.	2.14	0.22	0.12	42.2	0.88	109.2	-24	36.1	1.07	150
STIG10	26212	0.	3623.	0.	0.	-2688.	3695.	50.	381.	6.13	0.22	0.22	115.5	2.41	99.2	0	64.8	1.91	115
STIG1S	26212	0.	947.	0.	0.	-825.	975.	50.	50.	2.15	0.22	0.14	41.5	0.87	108.8	-18	35.5	1.05	152
STIG1S	26212	0.	2277.	0.	0.	-1728.	2401.	50.	224.	4.21	0.22	0.23	75.4	1.57	97.8	0	48.1	1.42	123
DEADV3	26212	0.	914.	0.	0.	-791.	975.	50.	50.	2.38	0.22	0.17	60.4	1.26	162.7	0	36.7	1.08	147
DEADV3	26212	0.	2342.	0.	0.	-1717.	2655.	50.	255.	5.48	0.22	0.29	175.2	3.66	221.9	0	55.8	1.65	118
DEHTPM	26212	0.	823.	0.	0.	-701.	975.	50.	50.	2.41	0.22	0.25	59.3	1.24	171.9	5	33.8	1.00	156
DEHTPM	26212	0.	1120.	0.	0.	-857.	1446.	50.	107.	3.34	0.22	0.34	92.8	1.94	215.1	0	36.2	1.07	142
DESOA3	26212	942.	0.	0.	-942.	123.	975.	50.	50.	2.59	0.22	0.14	68.6	1.43	180.7	0	45.1	1.33	147
DESOA3	26212	2807.	0.	0.	-2807	728.	3003.	50.	297.	7.37	0.22	0.25	248.5	5.19	268.3	0	90.8	2.68	132
DESOA3	26212	0.	942.	0.	0.	-826.	975.	50.	50.	2.59	0.22	0.14	68.6	1.43	180.7	0	38.6	1.14	143
DESOA3	26212	0	2807.	0.	0.	-2079.	3003.	50.	297.	7.37	0.22	0.25	248.5	5.19	268.3	0	71.5	2.11	118
GTSOAD	26212	832.	0.	0.	-832	123.	975.	50.	50.	1.70	0.22	0.24	36.4	0.76	104.8	-19	36.7	1.08	170
GTSOAD	26212	1042	0.	0.	-1042	219.	1297.	50.	89.	1.85	0.22	0.31	41.6	0.87	101.8	-32	37.7	1.11	161
GTRA08	26212	854.	0.	0.	-854.	123.	975.	50.	50.	1.90	0.22	0.22	44.7	0.93	126.3	-58	38.6	1.14	163
GTRA08	26212	1428.	0.	0.	-1428.	366.	1791.	50.	149.	2.61	0.22	0.34	69.7	1.46	133.6	0	44.2	1.30	146
GTRA12	26212	847.	0.	0.	-847.	123.	975.	50.	50.	1.91	0.22	0.23	45.2	0.94	128.4	-62	38.4	1.13	164
GTRA12	26212	1386	0.	0.	-1386.	357.	1759.	50.	145.	2.57	0.22	0.34	68.2	1.42	133.7	0	43.2	1.27	147
GTRA16	26212	845.	0.	0.	-845	123.	975.	50.	50.	1.94	0.22	0.23	46.2	0.97	131.7	-83	38.5	1.14	163
GTRA16	26212	1325.	0.	0.	-1325.	332.	1677.	50.	135.	2.57	0.22	0.34	68.5	1.43	139.3	0	42.8	1.26	148
GTR208	26212	846.	0.	0.	-846.	123.	975.	50.	50.	1.79	0.22	0.23	39.9	0.83	113.5	-28	37.7	1.11	166
GTR208	26212	1194.	0.	0.	-1194	275.	1494.	50.	112.	2.13	0.22	0.32	51.6	1.08	113.9	0	40.3	1.19	155
GTR212	26212	847.	0.	0.	-847.	123.	975.	50.	50.	1.81	0.22	0.23	40.7	0.85	115.8	-30	37.8	1.12	166
GTR212	26212	1242.	0.	0.	-1242.	294.	1551.	50.	120.	2.21	0.22	0.33	54.8	1.14	117.2	0	40.9	1.21	153
GTR216	26212	842.	0.	0.	-842.	123.	975.	50.	50.	1.83	0.22	0.23	41.8	0.87	119.5	-34	37.8	1.11	166
GTR216	26212	1247.	0.	0.	-1247.	302.	1576.	50.	123.	2.30	0.22	0.34	58.1	1.21	123.9	0	40.9	1.21	152
GTRW08	26212	892.	0.	0.	-892.	123.	975.	50.	50.	1.90	0.22	0.19	44.2	0.92	121.2	-66	40.0	1.18	160
GTRW08	26212	1731.	0.	0.	-1731.	437.	2026.	50.	178.	2.69	0.22	0.30	71.3	1.49	116.8	0	50.2	1.48	140
GTRW12	26212	877.	0.	0.	-877.	123.	975.	50.	50.	1.89	0.22	0.20	44.2	0.92	122.6	-61	39.4	1.16	161
GTRW12	26212	1693	0.	0.	-1693.	443.	2048.	50.	181.	2.70	0.22	0.32	71.7	1.50	119.6	0	48.4	1.43	141
GTRW16	26212	874.	0.	0.	-874.	123.	975.	50.	50.	1.91	0.22	0.20	44.9	0.94	125.0	-69	39.4	1.16	161
GTRW16	26212	1597.	0.	0.	-1597.	410.	1936.	50.	167.	2.49	0.22	0.32	63.7	1.33	111.5	0	46.3	1.37	145
GTR308	26212	907.	0.	0.	-907.	123.	975.	50.	50.	1.88	0.22	0.17	43.0	0.90	116.5	-58	40.4	1.19	159
GTR308	26212	1496.	0.	0.	-1496.	333.	1681.	50.	136.	2.25	0.22	0.26	54.9	1.15	101.3	0	47.4	1.40	146

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTR312	26212	869.	0.	0.	-869.	123.	975.	50.	50.	1.86	0.22	0.21	42.9	0.90	119.9	-47	38.9	1.15	163
GTR312	26212	1448.	0.	0.	-1448.	356.	1756.	50.	145.	2.27	0.22	0.31	56.0	1.17	106.1	0	44.0	1.30	149
GTR316	26212	870.	0.	0.	-870.	123.	975.	50.	50.	1.89	0.22	0.21	43.8	0.91	122.1	-54	39.1	1.15	162
GTR316	26212	1438.	0.	0.	-1438.	350.	1738.	50.	143.	2.31	0.22	0.31	57.3	1.20	109.1	0	44.2	1.30	148
FCPADS	26212	924.	0.	0.	-924.	123.	975.	50.	50.	6.71	0.22	0.16	57.1	1.19	152.6	0	47.3	1.40	156
FCPADS	26212	2824.	0.	0.	-2824.	771.	3146.	50.	314.	34.74	0.22	0.28	189.6	3.96	203.7	0	109.2	3.22	151
FCMCDS	26212	865.	0.	0.	-865.	123.	975.	50.	50.	6.39	0.22	0.21	59.1	1.24	165.6	0	45.0	1.33	'60
FCMCDS	26212	2060.	0.	0.	-2060.	610.	2607.	50.	249.	26.14	0.22	0.36	164.2	3.43	232.2	0	82.1	2.42	148

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GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		------------FUEL USE IN BTU-10**6------------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	OCH	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	26214	0.	71.	697.	0.	0.	0.	F	29.	0.	2.15	0.16	0.	40.7	1.00	193.6	0	24.1	1.00	80
STM141	26214	0.	575.	0.	0.	-504.	697.		29.	29.	1.40	0.16	0.25	24.4	0.60	100.0	999	21.6	0.90	172
STM141	26214	0.	615.	0.	0.	-520.	779.		29.	39.	1.17	0.16	0.30	24.2	0.59	94.4	999	20.7	0.86	166
STM141	26214	0.	0.	575.	0.	71.	122.	F	29.	29.	3.00	0.16	0.25	48.8	1.20	199.5	40	16.5	0.77	151
STM141	26214	0.	0.	615.	0.	96.	164.	F	29.	39.	2.75	0.16	0.30	52.2	1.28	203.6	35	17.4	0.72	142
STM141	26214	0.	0.	575.	0.	71.	122.	A	29.	29.	2.94	0.16	0.25	43.6	1.07	178.3	104	17.9	0.74	153
STM141	26214	0.	0.	615.	0.	96.	164.	A	29.	39.	2.50	0.16	0.30	37.0	0.91	144.6	999	15.5	0.64	149
STM088	26214	0.	575.	2.	0.	-504.	695.		29.	29.	1.10	0.16	0.25	21.9	0.54	89.7	999	21.1	0.88	164
STM088	26214	0.	1.	576.	0.	71.	121.	F	29.	29.	2.58	0.16	0.25	48.8	1.20	200.1	42	16.1	0.75	140
STM088	26214	0.	1.	576.	0.	71.	121.	A	29.	29.	2.42	0.16	0.25	35.6	0.87	145.9	999	16.5	0.69	146
PFBSTM	26214	0.	0.	579.	0.	71.	116.		29.	29.	3.70	0.16	0.25	51.1	1.26	208.2	28	19.5	0.81	151
PFBSTM	26214	0.	0.	716.	0.	153.	253.		29.	62.	4.26	0.16	0.36	52.2	1.28	182.7	39	16.2	0.67	143
TISTMT	26214	0.	578.	0.	0.	-507.	697.		29.	29.	2.67	0.16	0.25	73.7	1.81	300.3	0	22.3	1.18	152
TISTMT	26214	0.	676.	0.	0.	-547.	692.		29.	53.	3.39	0.16	0.34	101.2	2.48	369.2	0	30.4	1.26	145
TISTMT	26214	0.	0.	578.	0.	71.	119.		29.	29.	4.27	0.16	0.25	99.7	2.45	406.6	3	25.3	1.05	143
TISTMT	26214	0.	0.	799.	0.	203.	338.		29.	83.	5.79	0.16	0.40	169.3	4.16	546.1	2	27.9	1.16	134
TIHRSG	26214	0.	703.	0.	0.	-632.	697.		29.	29.	3.14	0.16	0.08	98.0	2.41	377.3	0	35.0	1.45	133
TIHRSG	26214	0.	614.	34.	0.	-543.	653.		29.	25.	2.92	0.16	0.16	88.9	2.18	351.6	0	32.1	1.33	130
TIHRSG	26214	0.	0.	628.	0.	71.	69.		29.	29.	4.37	0.16	0.18	131.9	3.24	507.6	0	30.4	1.26	136
TIHRSG	26214	0.	0.	686.	0.	96.	93.		29.	39.	5.07	0.16	0.22	149.5	3.67	540.1	0	31.5	1.31	128
STIRL	26214	631.	0.	0.	-631.	71.	697.		29.	29.	1.74	0.16	0.18	38.4	0.94	147.3	-82	29.4	1.22	159
STIRL	26214	817.	0.	0.	-817.	148.	954.		29.	60.	2.09	0.16	0.26	50.5	1.24	160.3	0	32.0	1.33	148
STIRL	26214	0.	631.	0.	0.	-560.	697.		29.	29.	1.74	0.16	0.18	38.4	0.94	147.4	-22	25.1	1.04	155
STIRL	26214	0.	817.	0.	0.	-669.	954.		29.	60.	2.09	0.16	0.26	50.6	1.24	160.5	0	26.3	1.09	142
STIRL	26214	0.	0.	631.	0.	71.	66.		29.	29.	3.38	0.16	0.18	64.1	1.57	245.6	13	21.3	0.89	139
STIRL	26214	0.	0.	1020.	0.	232.	214.		29.	94.	4.67	0.16	0.30	117.4	2.88	313.5	6	22.5	0.93	117
HEGT65	26214	0.	0.	724.	0.	71.	-27.	A	29.	29.	3.79	0.16	0.06	82.1	2.02	285.0	2	25.5	1.06	123
HEGT45	26214	0.	0.	4901.	0.	1190.	-457.	A	29.	485.	18.23	0.16	0.13	487.4	11.97	322.5	0	69.4	2.68	108
HEGT50	26214	0.	0.	710.	0.	71.	-13.	A	29.	29.	3.73	0.16	0.08	79.3	1.95	279.4	3	21.9	1.04	125
HEGT60	26214	0.	0.	1840.	0.	391.	-73.	A	29.	159.	7.23	0.16	0.15	179.2	4.40	291.4	0	34.0	1.41	91
HEGT00	26214	0.	0.	698.	0.	71.	-1.	A	29.	29.	3.67	0.16	0.09	75.6	1.86	269.5	4	24.2	1.01	128
HEGT00	26214	0.	0.	990.	0.	158.	-2.	A	29.	64.	4.25	0.16	0.14	98.3	2.41	266.7	2	25.6	1.06	111
FCMCCL	26214	0.	0.	862.	0.	71.	-165		29.	29.	4.02	0.16	-0.12	73.4	1.80	290.7	0	27.5	1.14	105
FCMCCL	26214	0.	0.	1289.	0.	282.	113.		29.	115.	6.69	0.15	0.23	119.0	2.92	315.0	2	26.3	1.09	107
FCSTCL	26214	0.	0.	855.	0.	71.	-158.		29.	29.	3.92	0.16	-0.11	71.2	1.75	284.1	0	27.0	1.12	106
FCSTCL	26214	0.	0.	1562.	0.	436.	557.		29.	178.	8.45	0.16	0.34	145.3	3.57	317.6	5	23.4	0.97	104
IGGTST	26214	0.	0.	890.	0.	71.	-193.		29.	29.	3.32	0.16	-0.16	68.4	1.68	262.1	0	26.7	1.11	101
IGGTST	26214	0.	0.	1455.	0.	304.	22.		29.	124.	3.87	0.16	0.18	115.4	2.83	270.4	5	24.0	1.00	97
GTSOAR	26214	0.	630.	0.	0.	-559.	697.		29.	29.	1.49	0.16	0.18	31.4	0.77	120.7	-5	24.1	1.00	159
GTSOAR	26214	0.	920.	0.	0.	-728.	1101.		29.	78.	1.76	0.16	0.29	40.0	0.98	115.7	-20	24.5	1.02	145
GTAC08	26214	0.	603.	0.	0.	-532.	697.		29.	29.	1.44	0.16	0.21	29.5	0.72	116.8	999	23.0	0.96	164
GTAC06	26214	0.	758.	0.	0.	-611.	951.		29.	60.	1.50	0.16	0.31	30.8	0.76	103.3	999	21.9	0.91	157
GTAC12	26214	0.	606.	0.	0.	-535.	697.		29.	29.	1.46	0.16	0.21	30.2	0.74	119.3	999	23.2	0.96	163

		FUEL USE IN BTU 10**6																	
		* COGENERATION CASE**			**NONCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC12	26214	0.	840.	0.	0.	-656.	1075.	29.	75.	1.64	0.16	0.33	35.6	0.87	110.5	999	22.1	0.92	152
GTAC16	26214	0.	609.	0.	0.	-538.	697.	29.	29.	1.48	0.16	0.21	31.1	0.76	122.1	999	23.4	0.97	162
GTAC16	26214	0.	902.	0.	0.	-692.	1160.	29.	85.	1.75	0.16	0.34	39.8	0.98	117.0	999	22.6	0.94	147
GTWC16	26214	0.	623.	0.	0.	-552.	697.	29.	29.	1.45	0.16	0.19	30.9	0.76	119.6	-2	23.8	0.99	161
GTWC16	26214	0.	964.	0.	0.	-746.	1169.	29.	89.	1.73	0.16	0.32	38.2	0.94	106.7	999	23.6	0.98	145
CC1626	26214	0.	625.	0.	0.	-554.	697.	29.	29.	1.58	0.16	0.19	31.1	0.76	120.2	-5	24.0	1.00	160
CC1626	26214	0.	1276.	0.	0.	-926.	1632.	29.	143.	2.26	0.16	0.36	51.7	1.27	115.0	0	24.6	1.03	132
CC1622	26214	0.	618.	0.	0.	-547.	697.	29.	29.	1.56	0.16	0.20	31.1	0.76	121.1	-2	23.8	0.99	161
CC1622	26214	0.	1163.	0.	0.	-848.	1514.	29.	129.	2.23	0.16	0.36	52.3	1.29	125.6	4	24.1	1.00	134
CC1222	26214	0.	616	0.	0.	-545.	697.	29.	29.	1.57	0.16	0.20	30.5	0.75	118.8	-1	23.7	0.98	162
CC1222	26214	0.	1154.	0.	0.	-840.	1510.	29.	128.	2.19	0.16	0.37	49.7	1.22	120.1	9	23.6	0.98	136
CC0822	26214	0.	606.	0.	0.	-534.	697.	29.	29.	1.56	0.16	0.21	30.3	0.74	119.6	999	23.3	0.97	164
CC0822	26214	0.	975.	0.	0.	-725.	1297.	29.	102.	1.92	0.16	0.37	40.3	0.99	111.5	999	21.9	0.91	145
STIG15	26214	0.	715.	0.	0.	-643.	697.	29.	29.	1.82	0.16	0.07	34.5	0.85	120.9	-29	27.3	1.13	146
STIG15	26214	0.	30000.	0.	0.	-21785.	27962.	29.	3350.	50.80	0.16	0.17	826.8	20.30	93.2	0	410.6	17.05	465
STIG10	26214	0.	691.	0.	0.	-620.	697.	29.	29.	1.63	0.16	0.10	30.3	0.75	109.0	-15	26.0	1.08	152
STIG10	26214	0.	2943.	0.	0.	-2184.	3002.	29.	310.	5.18	0.16	0.22	97.2	2.39	103.6	0	50.9	2.12	117
STIG1S	26214	0.	681.	0.	0.	-610.	697.	29.	29.	1.64	0.16	0.11	29.9	0.74	108.7	-13	25.6	1.06	154
STIG1S	26214	0.	1850.	0.	0.	-1404.	1951.	29.	182.	3.43	0.16	0.23	59.4	1.46	96.1	0	36.7	1.52	120
DEADV3	26214	0.	661.	0.	0.	-590.	697.	29.	29.	1.77	0.16	0.14	40.5	0.99	150.1	-87	26.3	1.09	150
DEADV3	26214	0.	1903.	0.	0.	-1335.	2157.	29.	207.	4.56	0.16	0.29	141.9	3.49	224.1	0	43.2	1.79	116
DEHTPM	26214	0.	603.	0.	0.	-538.	697.	29.	29.	1.87	0.16	0.21	41.8	1.03	164.5	0	24.9	1.03	156
DEHTPM	26214	0.	910.	0.	0.	-696.	1175.	29.	87.	2.81	0.16	0.34	74.7	1.83	218.0	0	27.2	1.13	137
DESOA3	26214	678.	0.	0.	-678.	71.	697.	29.	29.	1.90	0.16	0.12	45.2	1.11	164.8	0	32.1	1.33	150
DESOA3	26214	2281.	0.	0.	-2281.	592.	2440.	29.	241.	6.10	0.16	0.25	201.6	4.95	270.8	0	71.6	2.98	134
DESOA3	26214	0.	678.	0.	0.	-607.	697.	29.	29	1.90	0.16	0.12	45.2	1.11	164.8	0	27.4	1.14	146
DESOA3	26214	0.	2281.	0.	0.	-1689.	2440.	29.	241.	6.10	0.16	0.25	201.6	4.95	270.6	0	55.9	2.32	118
GTSOAD	26214	614.	0.	0.	-614.	71.	697.	29.	29.	1.43	0.16	0.20	29.0	0.71	113.3	-21	27.5	1.14	168
GTSOAD	26214	847.	0.	0.	-547.	178.	1054.	29.	72.	1.55	0.16	0.31	32.0	0.79	98.9	-29	28.2	1.17	159
GTRA08	26214	626.	0.	0.	-626.	71.	697.	29.	29.	1.51	0.16	0.18	32.3	0.79	124.6	-30	28.4	1.18	164
GTRA08	26214	1160.	0.	0.	-1160.	298.	1455.	29.	121.	2.10	0.16	0.34	51.8	1.27	124.7	0	33.1	1.37	142
GTRA12	26214	623.	0.	0.	-623.	71.	697.	29.	29.	1.51	0.16	0.19	32.5	0.80	126.0	-30	28.3	1.17	164
GTRA12	26214	1127.	0.	0.	-1127.	290.	1429.	29.	118.	2.10	0.16	0.34	52.3	1.28	128.8	0	32.5	1.35	143
GTRA16	26214	621.	0.	0.	-621.	71.	697.	29.	29.	1.53	0.16	0.19	33.3	0.82	129.2	-32	28.3	1.18	164
GTRA16	26214	1076.	0.	0.	-1076.	270.	1353.	29.	110.	2.10	0.16	0.34	52.4	1.29	133.9	0	32.2	1.34	144
GTR208	26214	622.	0.	0.	-622.	71.	697.	29.	29.	1.48	0.16	0.19	31.3	0.77	121.2	-26	28.1	1.17	165
GTR208	26214	970.	0.	0.	-970.	223.	1206.	29.	91.	1.84	0.16	0.32	42.7	1.05	118.7	0	30.7	1.27	150
GTR212	26214	622.	0.	0.	-622.	71.	697.	29.	29.	1.50	0.16	0.19	31.8	0.78	123.3	-28	28.2	1.17	165
GTR212	26214	1009.	0.	0.	-1009.	239.	1260.	29.	98.	1.91	0.16	0.33	45.4	1.12	122.3	0	31.2	1.30	148
GTR216	26214	619.	0.	0.	-619.	71.	697.	29.	29.	1.51	0.16	0.19	32.5	0.80	126.2	-29	28.1	1.17	164
GTR216	26214	1013.	0.	0.	-1013.	245.	1260.	29.	100.	1.98	0.16	0.34	48.2	1.18	129.2	0	31.2	1.30	147
GTRW08	26214	619.	0.	0.	-649.	71.	697.	29.	29.	1.51	0.16	0.16	32.2	0.79	121.0	-34	29.2	1.21	161
GTRW08	26214	1406.	0.	0.	-1406.	355.	1646.	29.	145.	2.18	0.16	0.30	53.7	1.32	110.1	0	38.1	1.58	137
GTRW12	26214	640.	0.	0.	-640.	71.	697.	29.	29.	1.50	0.16	0.17	32.2	0.79	122.1	-32	28.9	1.20	162

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTRW12	26214	1376.	0.	0.	-1376.	360.	1664.	29.	147.	2.18	0.16	0.32	54.0	1.33	112.8	0	36.6	1.52	138
GTRW16	26214	638.	0.	0.	-638.	71.	697.	29.	29.	1.52	0.16	0.17	32.7	0.80	124.4	-33	20.9	1.20	162
GTRW16	26214	1297.	0.	0.	-1297	333.	1573.	29.	136.	2.16	0.16	0.32	53.5	1.31	117.2	0	35.7	1.48	139
GTR308	26214	658.	0.	0.	-658.	71.	697.	29.	29.	1.50	0.16	0.14	31.4	0.77	116.8	-33	29.4	1.22	160
GTR308	26214	1216.	0.	0.	-1216.	271.	1366.	29.	110.	1.90	0.16	0.26	43.6	1.07	100.9	0	36.2	1.51	142
GTR312	26214	635.	0.	0.	-635.	71.	697.	29.	29.	1.49	0.16	0.17	31.3	0.77	119.6	-29	28.6	1.19	163
GTR312	26214	1177.	0.	0.	-1177.	289.	1427.	29.	118.	1.97	0.16	0.31	46.7	1.15	111.1	0	33.7	1.40	143
GTR316	26214	636.	0.	0.	-636.	71.	697.	29.	29.	1.50	0.16	0.17	32.0	0.78	121.8	-31	28.7	1.19	163
GTR316	26214	1169.	0.	0.	-1169.	285.	1412.	29.	116.	2.00	0.16	0.31	47.9	1.18	114.4	0	33.9	1.41	143
FCPADS	26214	667.	0.	0.	-667.	71.	697.	29.	29.	4.23	0.16	0.13	38.6	0.95	142.2	144	33.3	1.38	157
FCPADS	26214	2294.	0.	0.	-2294.	627.	2557.	29.	255.	28.29	0.16	0.28	153.7	3.78	205.5	0	86.5	3.59	156
FCMCDS	26214	633.	0.	0.	-633.	71.	697.	29.	29.	4.04	0.16	0.18	39.8	0.98	152.3	196	32.0	1.33	161
FCMCDS	26214	1674.	0.	0.	-1674.	496.	2118.	29.	202.	21.30	0.16	0.36	133.2	3.27	235.2	0	64.5	2.68	148

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		----------FUEL USE IN BTU*10**6----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD	POWER		/HEAT		COST	COST	EQVL		CHRG	ENRG	
									MW	MW		RATIO		*10**6			(%)			
ONOCGN	26216	0.	49.	525.	0.	0.	0.	F	20.	0.	1.30	0.22	0.	20.8	1.00	196.9	0	16.4	1.00	80
STM141	26216	0.	439.	15.	0.	-389.	510.		20.	18.	0.79	0.22	0.21	13.1	0.63	102.9	0	16.1	0.98	157
STM141	26216	0.	5.	449.	0.	44.	76.	F	20.	18.	1.66	0.22	0.21	27.1	1.30	213.0	34	12.9	0.78	134
STM141	26216	0.	5.	449.	0.	44.	76.	A	20.	18.	1.49	0.22	0.21	19.5	0.94	153.7	999	11.9	0.73	140
STM088	26216	0.	431.	57.	0.	-382.	469.		20.	13.	0.78	0.22	0.15	13.1	0.63	107.9	-10	17.1	1.04	150
STM088	26216	0.	17.	471.	0.	32.	55.	F	20.	13.	1.56	0.22	0.15	25.1	1.20	206.8	36	13.9	0.84	128
STM088	26216	0.	17.	471.	0.	32.	55.	A	20.	13.	1.44	0.22	0.15	18.5	0.89	152.6	999	13.0	0.79	135
PFBSTM	26216	0.	0.	444.	0.	49.	81.		20.	20.	2.59	0.22	0.23	34.3	1.65	263.5	15	14.2	0.86	143
PFBSTM	26216	0.	0.	485.	0.	73.	120.		20.	30.	2.51	0.22	0.29	32.6	1.57	229.9	22	12.8	0.78	137
TISTMT	26216	0.	444.	0.	0.	-395.	525.		20.	20.	1.97	0.22	0.23	51.7	2.48	397.9	0	21.1	1.29	146
TISTMT	26216	0.	525.	0.	0.	-428.	688.		20.	40.	2.49	0.22	0.33	79.2	3.80	514.8	0	23.3	1.42	140
TISTMT	26216	0.	0.	444.	0.	49.	82.		20.	20.	3.11	0.22	0.23	72.2	3.46	555.4	0	18.8	1.14	138
TISTMT	26216	0.	0.	525.	0.	97.	162.		20.	40.	3.56	0.22	0.33	100.3	4.81	652.2	0	19.9	1.21	132
TIHRSG	26216	0.	476.	3.	0.	-427.	522.		20.	20.	2.11	0.22	0.17	69.9	3.35	501.7	0	24.1	1.47	128
TIHRSG	26216	0.	1.	479.	0.	48.	47.		20.	20.	3.12	0.22	0.17	89.6	4.30	642.9	0	21.4	1.30	120
STIRL	26216	480.	0.	0.	-480.	49.	525.		20.	20.	1.18	0.22	0.16	21.6	1.03	153.4	0	21.4	1.30	157
STIRL	26216	643.	0.	0.	-643.	117.	751.		20.	48.	1.34	0.22	0.26	34.4	1.65	182.2	0	23.7	1.44	142
STIRL	26216	0.	480.	0.	0.	-431.	525.		20.	20.	1.18	0.22	0.16	21.6	1.04	153.5	0	18.1	1.10	152
STIRL	26216	0.	643.	0.	0.	-527.	751.		20.	48.	1.34	0.22	0.26	34.4	1.65	182.5	0	19.3	1.17	136
STIRL	26216	0.	0.	480.	0.	49.	45.		20.	20.	2.32	0.22	0.16	41.0	1.97	291.7	9	15.2	0.92	133
STIRL	26216	0.	0.	643.	0.	117.	108.		20.	48.	2.64	0.22	0.26	60.5	2.90	320.9	7	15.1	0.92	119
HEGT85	26216	0.	0.	544.	0.	49.	-19.	A	20.	20.	2.73	0.22	0.05	59.3	2.84	371.6	0	18.8	1.14	119
HEGT85	26216	0.	0.	2597.	0.	599.	-230.	A	20.	244.	9.43	0.22	0.12	245.2	11.77	322.3	0	38.5	2.34	94
HEGT60	26216	0.	0.	535.	0.	49.	-9.	A	20.	20.	2.67	0.22	0.07	56.9	2.73	363.2	0	18.3	1.11	121
HEGT60	26216	0.	0.	1056.	0.	197.	-37.	A	20.	80.	4.33	0.22	0.13	110.3	5.29	356.4	0	23.3	1.42	95
HEGT00	26216	0.	0.	526.	0.	49.	-1.	A	20.	20.	2.56	0.22	0.08	53.0	2.54	343.5	1	17.6	1.07	123
HEGT00	26216	0.	0.	629.	0.	80.	-1.	A	20.	32.	2.57	0.22	0.11	60.5	2.90	328.3	1	17.8	1.09	111
FCMCCL	26216	0.	0.	461.	0.	49.	65.		20.	20.	2.81	0.22	0.20	50.4	2.42	373.3	4	16.6	1.01	136
FCMCCL	26216	0.	0.	649.	0.	142.	187.		20.	58.	3.96	0.22	0.34	72.2	3.46	379.8	5	16.1	0.98	123
FCSTCL	26216	0.	0.	456.	0.	49.	69.		20.	20.	2.78	0.22	0.21	49.1	2.35	367.0	5	16.3	0.99	137
FCSTCL	26216	0.	0.	775.	0.	213.	301.		20.	87.	4.82	0.22	0.40	87.0	4.17	383.0	6	15.2	0.93	116
IGGTST	26216	0.	0.	481.	0.	49.	45.		20.	20.	2.40	0.22	0.16	47.9	2.30	340.0	5	16.2	0.99	132
IGGTST	26216	0.	0.	723.	0.	148.	134.		20.	60.	2.48	0.22	0.28	67.5	3.24	318.7	7	14.9	0.91	114
GTSOAR	26216	0.	479.	0.	0.	-430.	525.		20.	20.	1.03	0.22	0.17	18.0	0.86	128.3	-24	17.6	1.07	156
GTSOAR	26216	0.	724.	0.	0.	-573.	866.		20.	62.	1.07	0.22	0.29	26.1	1.25	123.0	0	17.9	1.09	137
GTAC08	26216	0.	461.	0.	0.	-412.	525.		20.	20.	0.99	0.22	0.20	16.6	0.79	122.6	-10	16.8	1.02	161
GTAC08	26216	0.	597.	0.	0.	-481.	749.		20.	47.	0.90	0.22	0.31	20.3	0.97	115.9	999	16.0	0.97	149
GTAC12	26216	0.	463.	0.	0.	-414.	525.		20.	20.	1.00	0.22	0.19	17.0	0.81	125.1	-12	16.9	1.03	161
GTAC12	26216	0.	661.	0.	0.	-516.	847.		20.	59.	1.01	0.22	0.33	24.1	1.16	124.5	11	16.2	0.98	143
GTAC16	26216	0.	465.	0.	0.	-416.	525.		20.	20.	1.01	0.22	0.19	17.6	0.84	128.8	-15	17.1	1.04	159
GTAC16	26216	0.	710.	0.	0.	-545.	913.		20.	67.	1.11	0.22	0.34	27.6	1.32	132.7	3	16.6	1.01	138
GTWC16	26216	0.	475.	0.	0.	-426.	525.		20.	20.	1.02	0.22	0.17	17.7	0.85	126.9	-20	17.4	1.06	156
GTWC16	26216	0.	759.	0.	0.	-587.	936.		20.	70.	1.09	0.22	0.32	26.7	1.28	120.0	0	17.4	1.06	136

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		------------FUEL USE IN BTU*10**6------------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
CC1626	26216	0.	476.	0.	0.	-427.	525.	20.	20.	1.12	0.22	0.17	17.8	0.85	127.7	-26	17.6	1.07	157
CC1626	26216	0.	991.	0.	0.	-722.	1262.	20.	110.	1.50	0.22	0.35	35.7	1.71	123.0	0	18.2	1.11	124
CC1622	26216	0.	471.	0.	0.	-422.	525.	20.	20.	1.11	0.22	0.18	17.7	0.85	127.8	-22	17.4	1.06	158
CC1622	26216	0.	904.	0.	0.	-662.	1171.	20.	99.	1.46	0.22	0.36	35.6	1.71	134.4	0	17.7	1.08	127
CC1222	26216	0.	470.	0.	0.	-421.	525.	20.	20.	1.10	0.22	0.18	17.2	0.82	124.7	-19	17.3	1.05	159
CC1222	26216	[illegible]	896.	0.	0.	-655.	1167.	20.	98.	1.43	0.22	0.36	33.7	1.62	128.3	0	17.3	1.05	128
CC0822	26216	0.	463.	0.	0.	-414.	525.	20.	20.	1.10	0.22	0.19	17.2	0.82	126.7	-16	17.1	1.04	160
CC0822	26216	0.	757.	0.	0.	-566.	1002.	20.	78.	1.26	0.22	0.37	27.9	1.34	126.0	8	16.2	0.98	136
STIG15	26216	0.	538.	0.	0.	-488.	525.	20.	20.	1.31	0.22	0.06	22.1	1.06	140.3	0	20.1	1.22	142
STIG15	26216	0.	23615.	0.	0.	-17148.	22011.	20.	2637.	39.96	0.22	0.17	651.1	31.24	94.1	0	322.7	19.64	529
STIG10	26216	0.	522.	0.	0.	-473.	525.	20.	20.	1.16	0.22	0.09	18.4	0.88	120.6	-50	19.0	1.16	149
STIG10	26216	0.	2317.	0.	0.	-1719.	2363.	20.	244.	3.83	0.22	0.22	72.6	3.48	107.0	0	38.9	2.37	117
STIG1S	26216	0.	514.	0.	0.	-465.	525.	20.	20.	1.16	0.22	0.10	18.1	0.87	120.4	-43	18.8	1.14	150
STIG1S	26216	0.	1456.	0.	0.	-1105.	1536.	20.	143.	2.51	0.22	0.23	44.3	2.13	103.9	0	27.8	1.69	114
DEADV3	26216	0.	501.	0.	0.	-452.	525.	20.	20.	1.24	0.22	0.13	24.3	1.17	165.9	0	19.1	1.16	146
DEADV3	26216	0.	1498.	0.	0.	-1098.	1698.	20.	163.	3.32	0.22	0.29	106.9	5.13	243.5	0	32.7	1.99	114
DEHTPM	26216	0.	465.	0.	0.	-416.	525.	20.	20.	1.28	0.22	0.19	23.9	1.15	175.4	0	18.0	1.10	153
DEHTPM	26216	0.	717.	0.	0.	-548.	925.	20.	69.	1.92	0.22	0.34	53.4	2.56	254.4	0	20.0	1.22	130
DESOA3	26216	512.	0.	0.	-512.	49.	525.	20.	20.	1.33	0.22	0.11	27.6	1.33	184.0	0	23.4	1.43	147
DESOA3	26216	1796.	0.	0.	-1796.	466.	1921.	20.	190.	4.54	0.22	0.25	154.0	7.39	292.6	0	55.1	3.35	139
DESOA3	26216	0.	512.	0.	0.	-463.	525.	20.	20.	1.33	0.22	0.11	27.6	1.33	184.0	0	19.9	1.21	142
DESOA3	26216	0.	1796.	0.	0.	-1330.	1921.	20.	190.	4.54	0.22	0.25	154.0	7.39	292.6	0	42.7	2.60	120
GTSOAD	26216	468.	0.	0.	-463.	49.	525.	20.	20.	0.98	0.22	0.18	16.1	0.77	117.3	-42	20.2	1.23	166
GTSOAD	26216	667.	0.	0.	-667.	140.	830.	20.	57.	0.94	0.22	0.31	21.3	1.02	109.0	999	21.0	1.28	152
GTRA08	26216	477.	0.	0.	-477.	49.	525.	20.	20.	1.04	0.22	0.17	18.6	0.89	133.3	-82	20.9	1.27	161
GTRA08	26216	913.	0.	0.	-913.	234.	1145.	20.	96.	1.41	0.22	0.34	38.1	1.83	142.2	0	25.0	1.52	135
GTRA12	26216	474.	0.	0.	-474.	49.	525.	20.	20.	1.04	0.22	0.17	18.7	0.90	134.9	-84	20.8	1.27	161
GTRA12	26216	887.	0.	0.	-887.	228.	1125.	20.	93.	1.36	0.22	0.34	36.2	1.74	139.5	0	24.2	1.47	136
GTRA16	26216	473.	0.	0.	-473.	49.	525.	20.	20.	1.06	0.22	0.18	19.3	0.93	139.4	107	20.8	1.27	161
GTRA16	26216	847.	0.	0.	-847.	213.	1073.	20.	87.	1.35	0.22	0.34	36.4	1.75	146.5	0	24.0	1.45	137
GTR206	26216	474.	0.	0.	-474.	49.	525.	20.	20.	1.02	0.22	0.18	17.8	0.86	128.5	-64	20.6	1.26	163
GTR206	26216	764.	0.	0.	-764.	176.	949.	20.	72.	1.13	0.22	0.32	28.3	1.36	126.6	0	22.7	1.38	143
GTR212	26216	474.	0.	0.	-474.	49.	525.	20.	20.	1.03	0.22	0.17	18.2	0.88	131.3	-72	20.7	1.26	162
GTR212	26216	794.	0.	0.	-794.	188.	992.	20.	77.	1.20	0.22	0.33	30.6	1.47	131.4	0	23.2	1.41	141
GTR216	26216	472.	0.	0.	-472.	49.	525.	20.	20.	1.04	0.22	0.18	18.7	0.90	135.2	-82	20.7	1.26	162
GTR216	26216	797.	0.	0.	-797.	193.	1008.	20.	79.	1.25	0.22	0.34	32.8	1.57	140.3	0	23.2	1.41	140
GTRW08	26216	492.	0.	0.	-492.	49.	525.	20.	20.	1.05	0.22	0.14	18.6	0.89	129.0	-92	21.4	1.31	159
GTRW08	26216	1107.	0.	0.	-1107.	279.	1296.	20.	114.	1.43	0.22	0.30	37.9	1.82	116.8	0	28.7	1.75	131
GTRW12	26216	486.	0.	0.	-486.	49.	525.	20.	20.	1.04	0.22	0.15	18.6	0.89	130.5	-87	21.2	1.29	160
GTRW12	26216	1083.	0.	0.	-1083.	283.	1310.	20.	116.	1.44	0.22	0.32	38.1	1.83	120.2	0	27.5	1.67	132
GTRW16	26216	485.	0.	0.	-485.	49.	525.	20.	20.	1.05	0.22	0.16	19.0	0.91	134.0	102	21.2	1.29	159
GTRW16	26216	1021.	0.	0.	-1021.	262.	1239.	20.	107.	1.41	0.22	0.32	37.7	1.81	125.9	0	26.8	1.63	133
GTR308	26216	498.	0.	0.	-498.	49.	525.	20.	20.	1.03	0.22	0.13	17.9	0.86	122.9	-78	21.6	1.31	158
GTR308	26216	957.	0.	0.	-957.	213.	1075.	20.	87.	1.24	0.22	0.26	31.2	1.50	111.2	0	27.4	1.67	135

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		------------FUEL USE IN BTU*10**6------------																	
		COGENERATION C/SE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTR312	26216	483.	0.	0.	-483.	49.	525.	20.	20.	1.03	0.22	0.16	18.0	0.86	126.9	-70	21.0	1.28	161
GTR312	26216	926.	0.	0.	-926.	228.	1123.	20.	93.	1.25	0.22	0.31	31.9	1.53	117.6	0	25.2	1.53	136
GTR316	26216	483.	0.	0.	-483.	49.	525.	20.	20.	1.04	0.22	0.16	18.4	0.89	130.2	-82	21.1	1.28	160
GTR316	26216	920.	0.	0.	-920.	224.	1112.	20.	91.	1.28	0.22	0.31	32.9	1.58	122.1	0	25.4	1.54	136
FCPADS	26216	505.	0.	0.	-505.	49.	525.	20.	20.	2.90	0.22	0.12	23.0	1.10	155.6	0	24.2	1.48	155
FCPADS	26216	1806.	0.	0.	-1806.	493.	2012.	20.	201.	21.96	0.22	0.28	116.5	5.59	220.1	0	66.9	4.06	163
FCMCDS	26216	481.	0.	0.	-481.	49.	525.	20.	20.	2.77	0.22	0.16	23.8	1.14	168.6	0	23.3	1.42	158
FCMCDS	26216	1318.	0.	0.	-1318.	390.	1667.	20.	159.	16.44	0.22	0.36	99.9	4.79	258.8	0	49.4	3.00	150

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
OHOCGN	26217	0.	77.	472.	0.	0.	0.	F	31.	0.	0.97	0.58	0.	14.8	1.00	235.3	0	16.5	1.00	80
STM141	26217	0.	307.	176.	0.	-231.	296.		31.	10.	0.62	0.58	0.12	9.2	0.62	123.5	-2	16.3	0.99	138
STM141	26217	0.	53.	431.	0.	24.	41.	F	31.	10.	1.22	0.58	0.12	18.6	1.25	249.3	30	14.7	0.89	118
STM141	26217	0.	53.	431.	0.	24.	41.	A	31.	10.	1.09	0.58	0.12	13.9	0.94	186.8	999	14.1	0.85	124
STM088	26217	0.	303.	200.	0.	-226.	272.		31.	7.	0.59	0.58	0.08	8.2	0.55	114.8	-8	16.8	1.02	134
STM088	26217	0.	60.	443.	0.	17.	29.	F	31.	7.	1.16	0.58	0.08	17.1	1.15	240.8	34	15.2	0.92	112
STM088	26217	0.	60.	443.	0.	17.	29.	A	31.	7.	1.05	0.58	0.08	13.1	0.88	184.5	999	14.7	0.89	118
PFBSTM	26217	0.	36.	405.	0.	41.	67.		31.	17.	1.73	0.58	0.20	22.9	1.54	274.1	22	14.0	0.85	127
TISTMT	26217	0.	330.	72.	0.	-253.	400.		31.	23.	1.76	0.58	0.27	53.1	3.58	583.3	0	19.8	1.20	132
TISTMT	26217	0.	22.	380.	0.	55.	92.		31.	23.	2.50	0.58	0.27	67.5	4.55	747.4	2	18.1	1.10	126
TIHRSG	26217	0.	331.	161.	0.	-255.	311.		31.	12.	1.48	0.58	0.10	47.5	3.20	571.6	0	21.5	1.30	110
TIHRSG	26217	0.	48.	444.	0.	29.	28.		31.	12.	2.19	0.58	0.10	61.0	4.11	734.5	0	20.2	1.22	104
STIRL	26217	384.	7.	24.	-384.	69.	448.		31.	28.	0.92	0.58	0.24	20.9	1.41	186.1	0	18.5	1.12	144
STIRL	26217	0.	391.	24.	0.	-314.	448.		31.	28.	0.92	0.58	0.24	21.0	1.41	186.4	13	15.8	0.96	140
STIRL	26217	0.	7.	408.	0.	69.	64.		31.	28.	1.75	0.58	0.24	36.2	2.44	322.2	15	13.3	0.81	126
HEGT85	26217	0.	0.	502.	0.	77.	-29.	A	31.	31.	2.92	0.58	0.09	68.5	4.62	466.0	0	19.2	1.16	117
HEGT85	26217	0.	0.	548.	0.	357.	-137.	A	31.	146.	6.38	0.58	0.12	169.9	11.44	374.5	0	30.0	1.82	96
HEGT60	26217	0.	0.	487.	0.	77.	-14.	A	31.	31.	2.75	0.58	0.11	63.5	4.28	445.3	1	18.2	1.10	120
HEGT60	26217	0.	0.	630.	0.	117.	-22.	A	31.	48.	2.97	0.58	0.13	76.6	5.16	415.0	0	19.2	1.16	109
HEGT00	26217	0.	29.	473.	0.	47.	-1.	A	31.	19.	1.78	0.58	0.09	41.9	2.83	382.0	4	16.8	1.02	107
FCMCCL	26217	0.	0.	371.	0.	77.	101.		31.	31.	2.77	0.58	0.32	49.4	3.33	454.8	8	14.8	0.90	144
FCMCCL	26217	0.	0.	387.	0.	84.	111.		31.	34.	2.65	0.58	0.34	49.7	3.35	438.6	9	14.4	0.87	134
FCSTCL	26217	0.	0.	365.	0.	77.	108.		31.	31.	2.85	0.58	0.34	50.0	3.37	467.9	8	14.9	0.90	145
FCSTCL	26217	0.	0.	455.	0.	123.	173.		31.	50.	3.20	0.58	0.39	59.0	3.98	442.6	9	14.1	0.86	136
IGGTST	26217	0.	0.	404.	0.	77.	68.		31.	31.	2.06	0.58	0.26	46.9	3.16	395.7	9	14.4	0.87	137
IGGTST	26217	0.	0.	424.	0.	85.	75.		31.	35.	1.85	0.58	0.27	46.9	3.16	377.1	10	13.9	0.84	126
GTSOAR	26217	0.	400.	0.	0.	-323.	472.		31.	31.	0.92	0.58	0.27	17.5	1.18	149.4	40	15.0	0.91	158
GTSOAR	26217	0.	432.	0.	0.	-342.	516.		31.	37.	0.79	0.58	0.29	17.8	1.20	141.1	39	14.8	0.90	148
GTAC08	26217	0.	363.	26.	0.	-287.	446.		31.	28.	0.67	0.58	0.29	13.8	0.93	132.4	999	14.0	0.85	154
GTAC12	26217	0.	374.	0.	0.	-297.	472.		31.	31.	0.87	0.58	0.32	16.1	1.09	147.1	131	14.0	0.85	164
GTAC12	26217	0.	394.	0.	0.	-308.	505.		31.	35.	0.74	0.58	0.33	16.2	1.09	140.2	136	13.7	0.83	154
GTAC16	26217	0.	378.	0.	0.	-301.	472.		31.	31.	0.93	0.58	0.31	17.4	1.17	156.9	56	14.3	0.87	162
GTAC16	26217	0.	423.	0.	0.	-325.	544.		31.	40.	0.81	0.58	0.34	18.5	1.24	148.9	45	14.0	0.85	152
GTWC16	26217	0.	393.	0.	0.	-316.	472.		31.	31.	0.93	0.58	0.28	17.2	1.16	149.7	49	14.8	0.89	159
GTWC16	26217	0.	452.	0.	0.	-350.	558.		31.	42.	0.81	0.58	0.32	18.4	1.24	138.6	38	14.5	0.88	150
CC1626	26217	0.	396.	0.	0.	-319.	472.		31.	31.	1.10	0.58	0.28	18.1	1.22	156.5	27	15.2	0.92	158
CC1626	26217	0.	582.	0.	0.	-426.	737.		31.	64.	1.12	0.58	0.35	24.1	1.63	141.5	14	15.2	0.92	144
CC1622	26217	0.	388.	0.	0.	-311.	472.		31.	31.	1.08	0.58	0.29	18.1	1.22	159.4	31	14.9	0.90	159
CC1622	26217	0.	531.	0.	0.	-390.	684.		31.	57.	1.07	0.58	0.36	23.4	1.58	150.5	17	14.8	0.90	146
CC1222	26217	0.	386.	0.	0.	-310.	472.		31.	31.	1.07	0.58	0.30	17.4	1.17	153.9	39	14.8	0.89	160
CC1222	26217	0.	526.	0.	0.	-387.	682.		31.	57.	1.05	0.58	0.36	22.2	1.49	143.9	20	14.0	0.85	148
CC0822	26217	0.	375.	0.	0.	-298.	472.		31.	31.	1.04	0.58	0.32	16.9	1.14	154.3	56	14.3	0.87	163
CC0822	26217	0.	444.	0.	0.	-334.	585.		31.	45.	0.94	0.58	0.36	18.7	1.26	143.7	40	13.9	0.84	153

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SUMMARY OF FUEL SAVED BY TYPE 3 ECONOMICS

ECS	PROCS	**COGENERATION CASE** DISTIL (FUEL USE IN BTU*10**6)	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
STIG15	26217	0.	491.	0.	0.	-415.	472.	31.	31.	1.32	0.58	0.11	18.8	1.26	130.3	0	18.3	1.11	140
STIG15	26217	0.	14077.	0.	0.	-10222.	13121.	31.	1572.	24.36	0.58	0.17	396.0	26.66	96.0	0	197.5	11.95	337
STIG10	26217	0.	466.	0.	0.	-390.	472.	31.	31.	1.19	0.58	0.15	17.7	1.19	129.3	0	17.3	1.05	146
STIG10	26217	0.	1381.	0.	0.	-1025.	1409.	31.	145.	2.46	0.58	0.22	44.5	3.00	109.9	0	27.2	1.65	115
STIGIS	26217	0.	455.	0.	0.	-378.	472.	31.	31.	1.18	0.58	0.17	17.1	1.15	128.3	0	16.9	1.02	149
STIGIS	26217	0.	868.	0.	0.	-659.	915.	31.	85.	1.64	0.58	0.23	27.0	1.82	106.3	0	20.6	1.24	128
DEADV3	26217	0.	434.	0.	0.	-357.	472.	31.	31.	1.28	0.58	0.21	26.7	1.80	209.6	0	17.3	1.05	144
DEADV3	26217	0.	893.	0.	0.	-655.	1012.	31.	97.	2.16	0.58	0.29	64.6	4.35	247.0	0	23.5	1.42	123
DEHTPM	26217	0.	377.	0.	0.	-300.	472.	31.	31.	1.31	0.58	0.31	27.4	1.85	248.1	10	15.7	0.95	154
DEHTPM	26217	0.	427.	0.	0.	-327.	551.	31.	41.	1.29	0.58	0.34	32.4	2.18	258.8	8	15.9	0.96	143
DESOA3	26217	452.	0.	0.	-452.	77.	472.	31.	31.	1.42	0.58	0.18	31.8	2.14	240.5	0	21.7	1.31	143
DESOA3	26217	1070.	0.	0.	-1070.	278.	1145.	31.	113.	2.90	0.58	0.25	92.8	6.25	296.0	0	36.9	2.23	131
DESOA3	26217	0.	452.	0.	0.	-375.	472.	31.	31.	1.42	0.58	0.18	31.8	2.14	240.5	0	18.6	1.12	136
DESOA3	26217	0.	1070.	0.	0.	-793.	1145.	31.	113.	2.90	0.58	0.25	92.8	6.25	296.0	0	29.5	1.79	120
GTSOAD	26217	383.	0.	0.	-383.	77.	472.	31.	31.	0.82	0.58	0.30	14.7	0.99	130.6	-24	16.7	1.01	169
GTSOAD	26217	397.	0.	0.	-397.	83.	494.	31.	34.	0.70	0.58	0.31	14.4	0.97	124.1	-10	16.6	1.00	159
GTRA08	26217	396.	0.	0.	-396.	77.	472.	31.	31.	1.00	0.58	0.28	19.1	1.28	164.3	0	17.9	1.08	161
GTRA08	26217	544.	0.	0.	-544.	140.	683.	31.	57.	0.98	0.58	0.34	24.3	1.64	152.5	0	19.0	1.15	150
GTRA12	26217	392.	0.	0.	-392.	77.	472.	31.	31.	1.01	0.58	0.29	19.3	1.30	168.1	0	17.7	1.07	161
GTRA12	26217	529.	0.	0.	-529.	136.	671.	31.	55.	0.[illegible]	0.58	0.34	24.5	1.65	158.2	0	18.7	1.13	150
GTRA16	26217	391.	0.	0.	-391.	77.	472.	31.	31.	1.02	0.53	0.29	20.1	1.35	175.2	0	17.8	1.08	161
GTRA16	26217	505.	0.	0.	-505.	127.	639.	31.	52.	0.98	0.58	0.34	24.6	1.66	166.4	0	18.6	1.12	150
GTR208	26217	391.	0.	0.	-391.	77.	472.	31.	31.	0.95	0.58	0.29	17.7	1.19	154.1	0	17.5	1.06	163
GTR208	26217	455.	0.	0.	-455.	105.	566.	31.	43.	0.83	0.58	0.32	19.2	1.30	144.1	0	17.7	1.07	154
GTR212	26217	392.	0.	0.	-392.	77.	472.	31.	31.	0.97	0.58	0.29	18.3	1.24	159.8	0	17.6	1.06	162
GTR212	26217	473.	0.	0.	-473.	112.	591.	31.	46.	0.88	0.58	0.33	20.8	1.40	149.7	0	18.0	1.09	153
GTR216	26217	389.	0.	0.	-389.	77.	472.	31.	31.	0.99	0.58	0.29	19.1	1.29	167.6	0	17.6	1.06	162
GTR216	26217	475.	0.	0.	-475.	115.	601.	31.	47.	0.91	0.58	0.34	22.1	1.49	158.6	0	18.0	1.09	152
GTRW08	26217	420.	0.	0.	-420.	77.	472.	31.	31.	1.02	0.58	0.23	19.0	1.28	154.4	0	18.8	1.14	157
GTRW08	26217	660.	0.	0.	-660.	166.	773.	31.	68.	1.06	0.58	0.30	26.2	1.76	135.4	0	21.4	1.30	144
GTRW12	26217	411.	0.	0.	-411.	77.	472.	31.	31.	1.01	0.58	0.25	19.0	1.28	157.8	0	18.4	1.11	158
GTRW12	26217	646.	0.	0.	-646.	169.	781.	31.	69.	1.06	0.58	0.32	26.3	1.77	139.3	0	20.7	1.26	145
GTRW16	26217	409.	0.	0.	-409.	77.	472.	31.	31.	1.02	0.58	0.26	13.5	1.32	163.1	0	18.4	1.11	158
GTRW16	26217	609.	0.	0.	-609.	156.	738.	31.	64.	1.04	0.58	0.32	26.1	1.76	146.1	0	20.3	1.23	146
GTR308	26217	4[illegible]	0.	0.	-430.	77.	472.	31.	31.	0.98	0.58	0.22	18.0	1.21	142.9	0	19.0	1.15	156
GTR308	26217	570.	0.	0.	-570.	127.	641.	31.	52.	0.92	0.58	0.26	21.4	1.44	128.0	0	20.6	1.24	146
GTR312	26217	406.	0.	0.	-406.	77.	472.	31.	31.	0.98	0.58	0.26	18.0	1.21	151.3	0	18.1	1.09	160
GTR312	26217	552.	0.	0.	-552.	136.	670.	31.	55.	0.93	0.58	0.31	22.0	1.48	135.9	0	19.3	1.17	150
GTR316	26217	407.	0.	0.	-407.	77.	472.	31.	31.	0.99	0.58	0.26	18.6	1.26	156.4	0	18.2	1.10	159
GTR316	26217	546.	0.	0.	-546.	134.	663.	31.	54.	0.95	0.58	0.31	22.7	1.53	141.4	0	19.4	1.17	149
FCPADS	26217	440.	0.	0.	-440.	77.	472.	31.	31.	3.95	0.58	0.20	24.9	1.68	192.9	0	23.1	1.40	153
FCPADS	26217	1076.	0.	0.	-1076.	294.	1200.	31.	120.	13.18	0.58	0.28	70.3	4.74	223.0	0	43.7	2.65	146
FCHCDS	26217	403.	0.	0.	-403.	77.	472.	31.	31.	3.74	0.58	0.27	25.8	1.74	218.4	0	21.6	1.31	158
FCHCDS	26217	785.	0.	0.	-785.	233.	994.	31.	95.	9.88	0.58	0.36	60.4	4.07	262.5	0	33.4	2.02	149

DATE 06/07/79
I&SE-PEO-ADV-DES-ENGR

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----------- FUEL USE IN BTU*10**6 -----------																			
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCON	26218	0.	37.	410.	0.	0.	0.	F	15.	0.	1.14	0.21	0.	17.9	1.00	213.0	0	13.0	1.00	80
STM141	26218	0.	345.	11.	0.	-308.	400.		15.	14.	0.71	0.21	0.20	11.2	0.62	111.5	-2	12.8	0.96	157
STM141	26218	0.	3.	353.	0.	34.	58.	F	15.	14.	1.44	0.21	0.20	22.9	1.28	226.4	32	10.4	0.80	134
STM141	26218	0.	3.	353.	0.	34.	58.	A	15.	14.	1.29	0.21	0.20	16.8	0.94	167.4	999	9.6	0.74	140
STM088	26218	0.	339.	43.	0.	-302.	367.		15.	10.	0.67	0.21	0.15	10.0	0.56	104.4	-9	13.4	1.03	152
STM088	26218	0.	13.	369.	0.	24.	41.	F	15.	10.	1.36	0.21	0.15	21.1	1.18	221.1	35	11.1	0.85	128
STM088	26218	0.	13.	369.	0.	24.	41.	A	15.	10.	1.25	0.21	0.15	15.8	0.88	165.0	999	10.4	0.80	134
PFBSTM	26218	0.	0.	350.	0.	37.	61.		15.	15.	2.21	0.21	0.22	29.3	1.62	285.8	13	11.5	0.89	143
PFBSTM	26218	0.	0.	382.	0.	56.	92.		15.	23.	2.12	0.21	0.28	27.8	1.55	248.4	20	10.4	0.80	137
TISTMT	26218	0.	349.	0.	0.	-312.	410.		15.	15.	1.69	0.21	0.22	42.6	2.38	416.7	0	17.0	1.30	146
TISTMT	26218	0.	414.	0.	0.	-339.	540.		15.	31.	2.13	0.21	0.33	66.2	3.70	546.1	0	18.9	1.45	140
TISTMT	26218	0.	0.	349.	0.	37.	61.		15.	15.	2.67	0.21	0.22	59.9	3.34	585.5	0	15.3	1.18	138
TISTMT	26218	0.	0.	414.	0.	75.	126.		15.	31.	3.04	0.21	0.33	84.0	4.69	692.8	0	16.4	1.26	132
TIHRSG	26218	0.	374.	0.	0.	-338.	410.		15.	15.	1.88	0.21	0.16	57.9	3.23	527.6	0	19.4	1.49	139
TIHRSG	26218	0.	378.	0.	0.	-340.	415.		15.	16.	1.80	0.21	0.17	58.8	3.28	531.4	0	19.4	1.49	129
TIHRSG	26218	0.	0.	374.	0.	37.	36.		15.	15.	2.83	0.21	0.16	75.3	4.20	686.4	0	17.6	1.35	132
TIHRSG	26218	0.	0.	378.	0.	38.	37.		15.	16.	2.66	0.21	0.17	75.5	4.21	681.9	0	17.4	1.34	121
STIRL	26218	376.	0.	0.	-376.	37.	410.		15.	15.	1.02	0.21	0.16	17.2	0.96	156.1	159	16.9	1.30	158
STIRL	26218	511.	0.	0.	-511.	93.	597.		15.	38.	1.13	0.21	0.26	27.6	1.54	183.9	0	18.8	1.44	142
STIRL	26218	0.	376.	0.	0.	-339.	410.		15.	15.	1.02	0.21	0.16	17.2	0.96	156.2	-61	14.3	1.10	153
STIRL	26218	0.	511.	0.	0.	-419.	597.		15.	38.	1.13	0.21	0.26	27.6	1.54	184.1	0	15.3	1.17	136
STIRL	26218	0.	0.	376.	0.	37.	34.		15.	15.	2.00	0.21	0.16	33.8	1.89	307.0	8	12.2	0.94	134
STIRL	26218	0.	0.	511.	0.	93.	86.		15.	38.	2.21	0.21	0.26	48.9	2.73	326.5	7	12.0	0.92	119
HEGT85	26218	0.	0.	424.	0.	37.	-14.	A	15.	15.	2.32	0.21	0.05	49.2	2.75	395.8	0	15.2	1.16	119
HEGT85	26218	0.	0.	2064.	0.	476.	-183.	A	15.	194.	7.92	0.21	0.12	208.3	11.62	344.5	0	32.3	2.48	96
HEGT60	26218	0.	0.	417.	0.	37.	-7.	A	15.	15.	2.27	0.21	0.07	47.3	2.64	387.3	0	14.8	1.14	121
HEGT60	26218	0.	0.	840.	0.	156.	-29.	A	15.	64.	3.66	0.21	0.13	93.8	5.23	381.3	0	19.2	1.48	95
HEGT00	26218	0.	0.	411.	0.	37.	-1.	A	15.	15.	2.18	0.21	0.06	44.2	2.46	367.0	0	14.2	1.09	123
HEGT00	26218	0.	0.	500.	0.	63.	-1.	A	15.	26.	2.18	0.21	0.11	51.4	2.87	351.1	0	14.5	1.11	111
FCMCCL	26218	0.	0.	362.	0.	37.	49.		15.	15.	2.37	0.21	0.19	42.1	2.35	396.9	3	13.4	1.03	136
FCMCCL	26218	0.	0.	515.	0.	113.	149.		15.	46.	3.31	0.21	0.34	61.1	3.41	404.7	4	13.2	1.02	123
FCSTCL	26218	0.	0.	359.	0.	37.	52.		15.	15.	2.37	0.21	0.20	41.0	2.29	390.6	4	13.3	1.02	137
FCSTCL	26218	0.	0.	611.	0.	167.	235.		15.	68.	4.01	0.21	0.40	73.1	4.08	406.3	5	12.7	0.97	117
IGGTST	26218	0.	0.	377.	0.	37.	33.		15.	15.	2.11	0.21	0.16	40.4	2.26	365.7	4	13.3	1.02	132
IGGTST	26218	0.	0.	570.	0.	115.	104.		15.	47.	2.17	0.21	0.28	57.3	3.20	343.3	6	12.4	0.96	114
GTSOAR	26218	0.	375.	0.	0.	-339.	410.		15.	15.	0.91	0.21	0.16	18.1	0.84	137.0	-22	14.0	1.07	156
GTSOAR	26218	0.	575.	0.	0.	-455.	689.		15.	49.	0.94	0.21	0.29	22.0	1.23	130.7	0	14.3	1.10	136
GTAC08	26218	0.	362.	0.	0.	-325.	410.		15.	15.	0.87	0.21	0.19	13.9	0.77	130.6	-11	13.4	1.03	161
GTAC08	26218	0.	474.	0.	0.	-382.	595.		15.	38.	0.79	0.21	0.31	17.1	0.95	122.0	999	12.7	0.98	149
GTAC12	26218	0.	363.	0.	0.	-326.	410.		15.	15.	0.88	0.21	0.19	14.1	0.79	132.7	-12	13.5	1.03	161
GTAC12	26218	0.	526.	0.	0.	-410.	673.		15.	47.	0.85	0.21	0.33	20.2	1.13	131.2	11	12.9	0.99	142
GTAC16	26218	0.	365.	0.	0.	-328.	410.		15.	15.	0.89	0.21	0.18	14.6	0.81	136.4	-14	13.6	1.04	160
GTAC16	26218	0.	564.	0.	0.	-433.	726.		15.	53.	0.96	0.21	0.34	23.1	1.29	139.6	1	13.2	1.01	137

GENERAL ELECTRIC COMPANY
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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6----------- **COGENERATION CASE**			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTWC16	26218	0.	372.	0.	0.	-335.	410.	15.	15.	0.90	0.21	0.17	14.8	0.83	135.6	-19	13.8	1.06	158
GTWC16	26218	0.	603.	0.	0.	-466.	744.	15.	56.	0.96	0.21	0.32	22.6	1.26	127.9	0	13.9	1.07	135
CC1626	26218	0.	373.	0.	0.	-337.	410.	15.	15.	1.00	0.21	0.16	14.9	0.83	136.2	-24	14.0	1.0C	157
CC1626	26218	0.	781.	0.	0.	-570.	992.	15.	86.	1.31	0.21	0.35	29.2	1.67	130.8	0	14.7	1.13	124
CC1622	26218	0.	370.	0.	0.	-333.	410.	15.	15.	0.99	0.21	0.17	14.7	0.82	135.4	-20	13.9	1.07	158
CC1622	26218	0.	712.	0.	0.	-523.	921.	15.	77.	1.27	0.21	0.36	29.5	1.64	141.2	0	14.2	1.09	127
CC1222	26218	0.	369.	0.	0.	-332.	410.	15.	15.	0.98	0.21	0.17	14.3	0.80	132.2	-18	13.8	1.06	159
CC1222	26218	0.	706.	0.	0.	-518.	918.	15.	77.	1.25	0.21	0.36	27.9	1.56	134.9	0	13.9	1.06	128
CC0822	26218	0.	363.	0.	0.	-327.	410.	15.	15.	0.98	0.21	0.19	14.4	0.80	134.9	-16	13.6	1.06	160
CC0822	26218	0.	597.	0.	0.	-448.	787.	15.	61.	1.10	0.21	0.36	23.3	1.30	133.5	6	13.0	1.00	136
STIG15	26218	0.	419.	0.	0.	-383.	410.	15.	15.	1.04	0.21	0.06	14.9	0.83	121.2	-41	15.4	1.18	147
STIG15	26218	0.	18769.	0.	0.	-13629.	17494.	15.	2096.	32.03	0.21	0.17	520.8	29.06	94.7	0	256.9	19.73	831
STIG10	26218	0.	407.	0.	0.	-371.	410.	15.	15.	0.98	0.21	0.09	14.3	0.80	120.0	-31	14.9	1.15	151
STIG10	26218	0.	1842.	0.	0.	-1366.	1878.	15.	194.	3.07	0.21	0.22	55.3	3.08	102.5	0	30.5	2.34	118
STIG1S	26218	0.	402.	0.	0.	-365.	410.	15.	15.	0.98	0.21	0.10	14.1	0.79	119.7	-27	14.8	1.13	152
STIG1S	26218	0.	1157.	0.	0.	-879.	1221.	15.	114.	2.12	0.21	0.23	37.3	2.08	109.9	0	22.3	1.71	114
DEADV3	26218	0.	392.	0.	0.	-355.	410.	15.	15.	1.11	0.21	0.12	21.1	1.18	184.1	0	15.3	1.18	146
DEADV3	26218	0.	1190.	0.	0.	-873.	1350.	15.	129.	2.74	0.21	0.29	85.5	4.77	245.0	0	25.9	1.98	115
DEHTPM	26218	0.	365.	0.	0.	-328.	410.	15.	15.	1.10	0.21	0.18	19.0	1.06	177.9	0	14.2	1.09	154
DEHTPM	26218	0.	569.	0.	0.	-436.	735.	15.	55.	1.61	0.21	0.34	42.8	2.39	256.7	0	15.9	1.22	130
DESOA3	26218	400.	0.	0.	-400.	37.	410.	15.	15.	1.11	0.21	0.10	20.9	1.16	177.9	0	18.3	1.41	150
DESOA3	26218	1427.	0.	0.	-1427.	370.	1527.	15.	151.	3.71	0.21	0.25	123.0	6.86	294.1	0	43.8	3.36	140
DESOA3	26218	0.	400.	0.	0.	-364.	410.	15.	15.	1.11	0.21	0.10	20.9	1.16	177.9	0	15.5	1.19	144
DESOA3	26218	0.	1427.	0.	0.	-1057.	1527.	15.	151.	3.71	0.21	0.25	123.0	6.86	294.1	0	33.9	2.61	121
GTSOAD	26218	367.	0.	0.	-367.	37.	410.	15.	15.	0.87	0.21	0.18	13.5	0.75	125.1	-37	16.0	1.23	166
GTSOAD	26218	530.	0.	0.	-530.	111.	659.	15.	45.	0.82	0.21	0.31	17.9	1.00	115.4	999	16.7	1.28	151
GTRA08	26218	374.	0.	0.	-374.	37.	410.	15.	15.	0.92	0.21	0.16	15.5	0.87	142.0	-66	16.6	1.27	161
GTRA08	26218	726.	0.	0.	-726.	186.	910.	15.	76.	1.22	0.21	0.34	32.2	1.79	151.3	0	20.0	1.53	134
GTRA12	26218	372.	0.	0.	-372.	37.	410.	15.	15.	0.92	0.21	0.17	15.6	0.87	143.3	-66	16.5	1.27	161
GTRA12	26218	705.	0.	0.	-705.	181.	894.	15.	74.	1.17	0.21	C.34	30.4	1.70	147.4	0	19.4	1.49	135
GTRA16	26218	371.	0.	0.	-371.	37.	410.	15.	15.	0.93	0.21	0.17	16.1	0.90	148.0	-79	16.5	1.27	161
GTRA16	26218	673.	0.	0.	-673.	169.	853.	15.	69.	1.17	0.21	0.34	30.6	1.71	155.0	0	19.2	1.47	136
GTR208	26218	371.	0.	0.	-371.	37.	410.	15.	15.	0.90	0.21	0.17	14.9	0.83	136.8	-53	16.4	1.26	163
GTR208	26218	607.	0.	0.	-607.	140.	754.	15.	57.	0 99	0.21	0.32	23.8	1.33	134.0	0	18.1	1.39	142
GTR212	26218	372.	0.	0.	-372.	37.	410.	15.	15.	0.91	0.21	0.17	15.2	0.85	139.8	-59	16.4	1.26	162
GTR212	26218	631.	0.	0.	-631.	150.	788.	15.	61.	1.04	0.21	0.33	25.7	1.44	139.2	0	18.5	1.42	140
GTR216	26218	370.	0.	0.	-370.	37.	410.	15.	15.	0.92	0.21	0.17	15.6	0.87	143.4	-64	16.4	1.26	162
GTR216	26218	634.	0.	0.	-634.	153.	801.	15.	63.	1.09	0.21	0.34	27.5	1.53	148.1	0	18.5	1.42	139
GTRW08	26218	385.	0.	0.	-385.	37.	410.	15.	15.	0.92	0.21	0.14	15.6	0.87	138.2	-75	17.0	1.31	159
GTRW08	26218	880.	0.	0.	-880.	222.	1030.	15.	90.	1.25	0.21	0.30	32.1	1.79	124.7	0	23.0	1.76	131
GTRW12	26218	381.	0.	0.	-381.	37.	410.	15.	15.	0.92	0.21	0.15	15.6	0.87	139.7	-72	16.8	1.29	160
GTRW12	26218	861.	0.	0.	-861.	225.	1041.	15.	92.	1.25	0.21	0.32	32.3	1.80	128.2	0	22.0	1.69	131
GTRW16	26218	380.	0.	0.	-380.	37.	410.	15.	15.	0.93	0.21	0.15	16.0	0.89	143.4	-81	16.8	1.29	159
GTRW16	26218	812.	0.	0.	-812.	208.	984.	15.	85.	1.23	0.21	0.32	32.0	1.78	134.4	0	21.5	1.65	132

REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTR308	26218	390.	0.	0.	-390.	37.	410.	15.	15.	0.91	0.21	0.13	15.0	0.84	131.4	-65	17.1	1.31	159
GTR308	26218	761.	0.	0.	-761.	169.	854.	15.	69.	1.08	0.21	0.26	26.4	1.47	118.3	0	21.9	1.68	134
GTR312	26218	378.	0.	0.	-378.	37.	410.	15.	15.	0.91	0.21	0.15	15.1	0.84	135.8	-59	16.7	1.28	161
GTR312	26218	736.	0.	0.	-736.	181.	893.	15.	74.	1.10	0.21	0.31	27.0	1.51	125.4	0	20.1	1.55	136
GTR316	26218	379.	0.	0.	-379.	37.	410.	15.	15.	0.92	0.21	0.15	15.5	0.86	139.4	-68	16.7	1.29	160
GTR316	26218	731.	0.	0.	-731.	178.	883.	15.	73.	1.12	0.21	0.31	27.9	1.56	130.3	0	20.3	1.56	135
FCPADS	26218	395.	0.	0.	-395.	37.	410.	15.	15.	2.26	0.21	0.12	17.6	0.98	151.7	999	18.9	1.45	157
FCPADS	26218	1435.	0.	0.	-1435.	392.	1599.	15.	160.	17.50	0.21	0.28	93.0	5.19	221.0	0	53.0	4.07	163
FCMCDS	26218	377.	0.	0.	-377.	37.	410.	15.	15.	2.16	0.21	0.16	18.1	1.01	163.9	999	18.2	1.40	159
FCMCDS	26218	1047.	0.	0.	-1047.	310.	1325.	15.	126.	13.12	0.21	0.36	80.0	4.47	260.8	0	39.2	3.01	150

COGENERATION TECHNOLOGY ALTERNATIVES STUDY

REPORT 5.2

SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																			
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28001	0.	80.	1561.	0.	0.	0.	F	33.	0.	3.18	0.10	0.	60.1	1.00	158.4	0	44.6	1.00	80
STM141	28001	0.	1425.	0.	0.	-1345.	1561.		33.	33.	1.92	0.10	0.13	38.4	0.64	92.0	-23	51.5	1.15	162
STM141	28001	0.	1529.	0.	0.	-1385.	1774.		33.	58.	1.66	0.10	0.20	39.8	0.66	88.9	-19	49.4	1.11	154
STM141	28001	0.	0.	1425.	0.	80.	136.	F	33.	33.	4.40	0.10	0.13	77.7	1.29	186.1	22	39.2	0.88	137
STM141	28001	0.	0.	1529.	0.	143.	245.	F	33.	58.	4.00	0.10	0.20	76.0	1.27	169.7	35	35.3	0.79	130
STM141	28001	0.	0.	1425.	0.	80.	136.	A	33.	33.	4.17	0.10	0.13	62 9	1.05	150.6	122	37.3	0.84	141
STM141	28001	0.	0.	1529.	0.	143.	245.	A	33.	58.	3.88	0.10	0.20	58.1	0.97	129.6	999	33.2	0.74	135
STM088	28001	0.	1425.	0.	0.	-1345.	1561.		33.	33.	1.84	0.10	0.13	36.8	0.61	88.1	-21	51.2	1.15	163
STM088	28001	0.	1458.	0.	0.	-1358.	1629.		33.	41.	1.56	0.10	0.16	36.2	0.60	84.8	-19	50.3	1.13	155
STM088	28001	0.	0.	1425.	0.	80.	136.	F	33.	33.	4.27	0.10	0.13	76.6	1.28	183.6	24	38.9	0.87	137
STM088	28001	0.	0.	1458.	0.	100.	171.	F	33.	41.	3.72	0.10	0.16	71.1	1.18	166.5	41	36.7	0.82	130
STM088	28001	0.	0.	1425.	0.	80.	136.	A	33.	33.	4.12	0.10	0.13	58.9	0.98	141.1	999	38.8	0.83	143
STM088	28001	0.	0.	1458.	0.	100.	171.	A	33.	41.	3.74	0.10	0.16	56.1	0.93	131.2	999	35.1	0.79	135
PFBSTM	28001	0.	0.	1430.	0.	80.	131.		33.	33.	5.20	0.10	0.13	78.2	1.30	186.5	19	40.1	0.90	137
PFBSTM	28001	0.	0.	1710.	0.	244.	401.		33.	99.	6.81	0.10	0.27	75.2	1.25	150.0	43	33.0	0.74	127
TISTMT	28001	0.	1428.	0.	0.	-1349.	1561.		33.	33.	3.26	0.10	0.13	92.1	1.53	219.9	0	58.7	1.32	144
TISTMT	28001	0.	1850.	0.	0.	-1520.	2399.		33.	135.	5.95	0.10	0.32	205.8	3.43	379.8	0	66.5	1.49	125
TISTMT	28001	0.	0.	1428.	0.	80.	133.		33.	33.	5.74	0.10	0.13	134.1	2.23	320.5	2	46.7	1.05	130
TISTMT	28001	0.	0.	1850.	0.	330.	549.		33.	135.	8.74	0.10	0.32	258.9	4.31	477.7	2	50.3	1.13	113
TIHRSG	28001	0.	1483.	0.	0.	-1404.	1561.		33.	33.	3.79	0.10	0.10	117.4	1.95	270.0	0	63.5	1.42	138
TIHRSG	28001	0.	1703.	0.	0.	-1531.	1871.		33.	70.	5.19	0.10	0.17	184.9	3.08	370.4	0	71.4	1.60	125
TIHRSG	28001	0.	0.	1483.	0.	80.	77.		33.	33.	6.52	0.10	0.10	166.7	2.78	383.6	0	52.0	1.17	125
TIHRSG	28001	0.	0.	1703.	0.	172.	167.		33.	70.	7.90	0.10	0.17	234.8	3.91	470.3	0	57.2	1.28	114
STIRL	28001	1487.	0.	0.	-1487.	80.	1561.		33.	33.	2.28	0.10	0.09	55.1	0.92	126.5	158	66.2	1.48	156
STIRL	28001	2306.	0.	0.	-2306.	418.	2692.		33.	170.	3.71	0.10	0.26	117.8	1.96	174.4	0	78.3	1.76	127
STIRL	28001	0.	1487.	0.	0.	-1407.	1561.		33.	33.	2.28	0.10	0.09	55.1	0.92	126.5	-86	55.5	1.24	150
STIRL	28001	0.	2306.	0.	0.	-1888.	2692.		33.	170.	3.71	0.10	0.26	118.0	1.96	174.6	0	61.8	1.39	118
STIRL	28001	0.	0.	1487.	0.	80.	74.		33.	33.	4.82	0.10	0.09	97.7	1.63	224.2	9	42.7	0.96	129
STIRL	23001	0.	0.	2306.	0.	418.	386.		33.	170.	7.92	0.10	0.26	210.4	3.50	311.4	5	44.9	1.01	99
HEGT85	28001	0.	0.	1592.	0.	80.	-31.	A	33.	33.	5.13	0.10	0.03	111.6	1.86	239.4	1	46.7	1.05	121
HEGT85	28001	0.	0.	9304.	0.	2147.	-823.	A	33.	875.	31.64	0.10	0.12	833.7	13.88	305.8	0	123.5	2.77	104
HEGT60	28001	0.	0.	1576.	0.	80.	-15.	A	33.	33.	5.08	0.10	0.04	108.5	1.81	235.0	2	46.0	1.03	122
HEGT60	28001	0.	0.	3785.	0.	705.	-132.	A	33.	287.	11.55	0.10	0.13	272.1	4.53	245.3	0	59.5	1.33	79
HEGT00	28001	0.	0.	1562.	0.	80.	-1.	A	33.	33.	5.05	0.10	0.05	104.3	1.74	227.9	3	45.2	1.01	124
HEGT00	28001	0.	0.	2252.	0.	285.	-4.	A	33.	116.	6.75	0.10	0.11	149.4	2.49	226.3	2	47.6	1.07	97
FCMCCL	28001	0.	0.	1456.	0.	80.	105.		33.	33.	5.55	0.10	0.11	106.7	1.78	250.0	5	44.3	0.99	131
FCMCCL	28001	0.	0.	2324.	0.	508.	670.		33.	207.	11.53	0.10	0.34	183.4	3.05	269.4	8	39.5	0.89	103
FCSTCL	28001	0.	0.	1449.	0.	80.	112.		33.	33.	5.45	0.10	0.12	104.7	1.74	246.5	6	43.9	0.98	131
FCSTCL	28001	0.	0.	2732.	0.	739.	1037.		33.	302.	13.72	0.10	0.39	217.9	3.63	272.2	9	34.0	0.76	100
IGGTST	28001	0.	0.	1490.	0.	80.	71.		33.	33.	4.65	0.10	0.09	99.6	1.66	228.1	7	43.3	0.97	129
IGGTST	28001	0.	0.	2546.	0.	509.	451.		33.	207.	5.63	0.10	0.27	178.8	2.98	239.7	9	37.2	0.83	94
GTSOAR	28001	0.	1486.	0.	0.	-1406.	1561.		33.	33.	2.04	0.10	0.09	48.8	0.81	112.2	-45	54.5	1.22	153
GTSOAR	28001	0.	2594.	0.	0.	-2053.	3104.		33.	220.	2.88	0.10	0.29	88.6	1.48	116.6	0	56.9	1.28	119

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		----------FUEL USE IN BTU*10**6----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTAC08	28001	0.	1456.	0.	0.	-1376.	1561.	33.	33.	1.91	0.10	0.11	43.5	0.72	101.9	-30	52.9	1.19	157
GTAC08	28001	0.	2138.	0.	0.	-1723.	2683.	33.	169.	2.22	0.10	0.31	64.0	1.07	102.2	0	49.5	1.11	131
GTAC12	28001	0.	1459.	0.	0.	-1379.	1561.	33.	33.	2.00	0.10	0.11	47.6	0.79	111.3	-38	53.5	1.20	155
GTAC12	28001	0.	2370.	0.	0.	-1850.	3033.	33.	212.	2.57	0.10	0.33	77.1	1.28	111.0	0	49.9	1.12	125
GTAC16	28001	0.	1463.	0.	0.	-1383.	1561.	33.	33.	2.02	0.10	0.11	48.5	0.81	113.2	-41	53.8	1.21	154
GTAC16	28001	0.	2544.	0.	0.	-1953.	3271.	33.	241.	2.86	0.10	0.34	88.3	1.47	118.4	0	51.1	1.15	122
GTWC16	28001	0.	1479.	0.	0.	-1399.	1561.	33.	33.	2.02	0.10	0.10	48.3	0.80	111.4	-42	54.2	1.22	154
GTWC16	28001	0.	2718.	0.	0.	-2103.	3355.	33.	251.	2.73	0.10	0.32	82.4	1.37	103.5	0	53.9	1.21	121
CC1626	28001	0.	1481.	0.	0.	-1402.	1561.	33.	33.	2.12	0.10	0.10	48.3	0.80	111.2	-47	54.6	1.22	154
CC1626	28001	0.	3490.	0.	0.	-2556.	4422.	33.	381.	3.66	0.10	0.35	108.3	1.80	105.9	0	56.1	1.28	117
CC1622	28001	0.	1474.	0.	0.	-1394.	1561.	33.	33.	2.12	0.10	0.10	48.3	0.80	111.9	-46	54.3	1.22	154
CC1622	28001	0.	3184.	0.	0.	-2345.	4105.	33.	342.	3.68	0.10	0.36	114.1	1.90	122.2	0	54.8	1.23	117
CC1222	28001	0.	1472.	0.	0.	-1392.	1561.	33.	33.	2.11	0.10	0.10	47.6	0.79	110.4	-44	54.2	1.21	154
CC1222	28001	0.	3157.	0.	0.	-2322.	4089.	33.	340.	3.57	0.10	0.36	106.4	1.77	115.1	0	53.4	1.20	118
CC0822	28001	0.	1460.	0.	0.	-1380.	1561.	33.	33.	2.10	0.10	0.11	47.3	0.79	110.7	-41	53.7	1.21	155
CC0822	28001	0.	2668.	0.	0.	-2007.	3506.	33.	269.	2.95	0.10	0.36	83.6	1.39	107.0	0	49.1	1.10	123
STIG15	28001	0.	1581.	0.	0.	-1501.	1561.	33.	33.	2.31	0.10	0.04	48.5	0.81	104.7	-55	57.8	1.30	148
STIG15	28001	0.	84615.	0.	0.	-61444.	78868.	33.	9449.	142.09	0.10	0.17	2270 3	37.79	91.6	0	1173.3	26.32	696
STIG10	28001	0.	1555.	0.	0.	-1475.	1561.	33.	33.	2.19	0.10	0.05	47.5	0.73	104.2	-49	56.8	1.27	150
STIG10	28001	0.	8302.	0.	0.	-6159.	8468.	33.	874.	11.72	0.10	0.22	222.1	3.70	91.3	0	129.5	2.91	129
STIG1S	28001	0.	1543.	0.	0.	-1463.	1561.	33.	33.	2.20	0.10	0.06	47.0	0.78	104.0	-46	56.3	1.26	151
STIG1S	28001	0.	5218.	0.	0.	-3961.	5503.	33.	513.	7.50	0.10	0.23	136.2	2.27	89.1	0	91.0	2.04	117
DEADV3	28001	0.	1521.	0.	0.	-1441.	1561.	33.	33.	2.39	0.10	0.07	60.7	1.01	136.2	999	57.3	1.28	146
DEADV3	28001	0.	5366.	0.	0.	-3935.	6085.	33.	584.	9.83	0.10	0.29	352.1	5.86	223.9	0	106.5	2.39	120
DEHTPM	28001	0.	1462.	0.	0.	-1383.	1561.	33.	33.	2.49	0.10	0.11	62.2	1.04	145.2	0	55.7	1.25	149
DEHTPM	28001	0.	2567.	0.	0.	-1964.	3314.	33.	246.	5.55	0.10	0.34	185.2	3.08	246.1	0	63.7	1.43	115
DESOA3	28001	1540.	0.	0.	-1540.	80.	1561.	33.	33.	2.52	0.10	0.06	66.0	1.10	146.3	0	69.6	1.56	150
DESOA3	28001	6433.	0.	0.	-6433.	1669.	6883.	33.	681.	14.00	0.10	0.25	516.0	8.59	273.7	0	188.7	4.23	158
DESOA3	28001	0.	1540.	0.	0.	-1460.	1561.	33.	33.	2.52	0.10	0.06	66.0	1.10	146.3	0	58.6	1.31	143
DESOA3	28001	0.	6433.	0.	0.	-4764.	6883.	33.	681.	14.00	0.10	0.25	516.0	8.59	273.7	0	142.4	3.19	132
GTSOAD	28001	1468.	0.	0.	-1468.	80.	1561.	33.	33.	1.97	0.10	0.11	46.2	0.77	107.4	-67	64.2	1.44	161
GTSOAD	28001	2388.	0.	0.	-2388.	501.	2972.	33.	204.	2.33	0.10	0.31	67.3	1.12	96.2	0	68.0	1.52	136
GTRA08	28001	1482.	0.	0.	-1482.	80.	1561.	33.	33.	2.05	0.10	0.10	49.8	0.83	114.8	-89	65.2	1.46	159
GTRA08	28001	3271.	0.	0.	-3271.	839.	4104.	33.	342.	3.87	0.10	0.34	126.2	2.10	131.7	0	82.3	1.85	128
GTRA12	28001	1478.	0.	0.	-1478.	80.	1561.	33.	33.	2.06	0.10	0.10	50.1	0.83	115.8	-90	65.1	1.46	159
GTRA12	28001	3177.	0.	0.	-3177.	818.	4031.	33.	333.	3.79	0.10	0.34	123.2	2.05	132.3	0	80.0	1.80	128
GTRA16	28001	1476.	0.	0.	-1476.	80.	1561.	33.	33.	2.08	0.10	0.10	51.0	0.85	117.8	-96	65.1	1.46	158
GTRA16	28001	3036.	0.	0.	-3036.	761.	3843.	33.	310.	3.79	0.10	0.34	123.7	2.06	139.1	0	79.2	1.78	128
GTR208	28001	1477.	0.	0.	-1477.	80.	1561.	33.	33.	2.03	0.10	0.10	48.7	0.81	112.6	-81	64.9	1.45	159
GTR208	28001	2736.	0.	0.	-2736.	629.	3401.	33.	257.	3.08	0.10	0.32	96.3	1.60	120.2	0	74.8	1.68	130
GTR212	28001	1477.	0.	0.	-1477.	80.	1561.	33.	33.	2.04	0.10	0.10	49.3	0.82	113.9	-84	65.0	1.46	159
GTR212	28001	2845.	0.	0.	-2845.	675.	3553.	33.	275.	3.28	0.10	0.33	104.0	1.73	124.7	0	76.3	1.71	129
GTR216	28001	1474.	0.	0.	-1474.	80.	1561.	33.	33.	2.06	0.10	0.10	50.1	0.83	115.9	-89	64.9	1.46	159
GTR216	28001	2857.	0.	0.	-2857.	692.	3611.	33.	282.	3.48	0.10	0.34	111.7	1.86	133.4	0	76.4	1.71	128

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTRW08	28001	1507.	0.	0.	-1507.	80.	1561.	33.	33.	2.05	0.10	0.08	49.7	0.83	112.4	-91	66.2	1.48	157
GTRW08	28001	3966.	0.	0.	-3966.	1001.	4644.	33.	408.	3.95	0.10	0.30	127.2	2.12	109.4	0	96.3	2.16	130
GTRW12	28001	1497.	0.	0.	-1497.	80.	1561.	33.	33.	2.05	0.10	0.09	49.6	0.83	113.1	-89	65.8	1.48	158
GTRW12	28001	3880.	0.	0.	-3880.	1015.	4693.	33.	414.	3.97	0.10	0.32	128.0	2.13	112.6	0	91.9	2.06	130
GTRW16	28001	1495.	0.	0.	-1495.	80.	1561.	33.	33.	2.06	0.10	0.09	50.2	0.84	114.6	-93	65.8	1.48	158
GTRW16	28001	3659.	0.	0.	-3659.	939.	4438.	33.	383.	3.91	0.10	0.32	126.6	2.11	118.1	0	89.3	2.00	129
GTR308	28001	1517.	0.	0.	-1517.	80.	1561.	33.	33.	2.04	0.10	0.08	48.8	0.81	109.7	-86	66.4	1.49	157
GTR308	28001	3429.	0.	0.	-3429.	764.	3852.	33.	312.	3.13	0.10	0.26	96.1	1.60	95.6	0	90.8	2.04	129
GTR312	28001	1492.	0.	0.	-1492.	80.	1561.	33.	33.	2.03	0.10	0.09	48.7	0.81	111.5	-83	65.5	1.47	159
GTR312	28001	3319.	0.	0.	-3319.	816.	4025.	33.	333.	3.24	0.10	0.31	100.8	1.68	103.6	0	82.8	1.86	130
GTR316	28001	1493.	0.	0.	-1493.	80.	1561.	33.	33.	2.04	0.10	0.09	49.4	0.82	112.9	-87	65.6	1.47	158
GTR316	28001	3296.	0.	0.	-3296.	803.	3983.	33.	327.	3.31	0.10	0.31	103.5	1.72	107.2	0	83.3	1.87	129
FCPADS	28001	1528.	0.	0.	-1528.	80.	1561.	33.	33.	5.29	0.10	0.07	58.8	0.98	131.3	999	71.2	1.60	154
FCPADS	28001	6471.	0.	0.	-6471.	1767.	7211.	33.	721.	80.02	0.10	0.28	379.9	6.32	200.4	0	233.7	5.24	190
FCMCDS	28001	1489.	0.	0.	-1489.	80.	1561.	33.	33.	5.06	0.10	0.09	59.8	1.00	137.1	999	69.6	1.56	156
FCMCDS	28001	4721.	0.	0.	-4721.	1398.	5974.	33.	570.	60.04	0.10	0.36	340.4	5.66	246.0	0	171.6	3.85	166

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		FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCON	28002	0.	189.	1874.	0.	0.	0.	F	77.	0.	3.09	0.25	0.	58.4	1.00	160.7	0	58.4	1.00	80
STM141	28002	0.	1517.	174.	0.	-1327.	1700.		77.	56.	1.63	0.25	0.18	38.7	0.66	90.1	-9	59.6	1.02	152
STM141	28002	0.	52	1639.	0.	137.	235.	F	77.	56.	3.88	0.25	0.18	73.8	1.26	172.0	45	46.1	0.79	130
STM141	28002	0.	52.	1639.	0.	137.	235.	A	77.	56.	3.76	0.25	0.18	56.6	0.97	131.7	999	44.1	0.76	136
STM088	28002	0.	1490.	313.	0.	-1301.	1561.		77.	39.	1.53	0.25	0.13	35.1	0.60	85.8	-16	62.7	1.07	147
STM088	28002	0.	93.	1710.	0.	96.	164.	F	77.	39.	3.61	0.25	0.13	69.0	1.18	168.6	45	49.8	0.85	124
STM088	28002	0.	93.	1710.	0.	96.	164.	A	77.	39.	3.63	0.25	0.13	54.6	0.93	133.4	999	48.2	0.83	129
PFBSTM	28002	0.	0.	1563.	0.	189.	311.		77.	77.	6.53	0.25	0.24	77.6	1.33	169.4	43	43.8	0.75	147
PFBSTM	28002	0.	0.	1638.	0.	234.	384.		77.	95.	6.58	0.25	0.27	73.0	1.25	152.1	61	41.1	0.70	140
TISTMT	28002	0.	1559.	0.	0.	-1369.	1874.		77.	77.	4.70	0.25	0.24	146.6	2.51	321.0	0	70.2	1.20	146
TISTMT	28002	0.	1772.	0.	0.	-1456.	2299.		77.	129.	5.77	0.25	0.32	199.1	3.41	383.3	0	73.3	1.26	139
TISTMT	28002	0.	0.	1559.	0.	189.	315.		77.	77.	7.32	0.25	0.24	191.8	3.28	420.0	6	56.9	0.97	136
TISTMT	28002	0.	0.	1772.	0.	316.	526.		77.	129.	8.47	0.25	0.32	250.4	4.29	482.3	5	57.9	0.99	129
TIHRSG	28002	0.	1656.	81.	0.	-1467.	1793.		77.	67.	5.03	0.25	0.16	178.8	3.06	373.8	0	79.3	1.36	125
TIHRSG	28002	0.	24.	1713.	0.	165.	160.		77.	67.	7.65	0.25	0.16	227.1	3.89	474.7	0	65.7	1.13	116
STIRL	28002	1699.	0.	0.	-1699.	189.	1874.		77.	77.	2.84	0.25	0.18	74.4	1.27	149.5	0	77.1	1.32	154
STIRL	28002	2209.	0.	0.	-2209.	400.	2579.		77.	163.	3.57	0.25	0.26	113.0	1.94	174.6	0	84.4	1.45	141
STIRL	28002	0.	1699.	0.	0.	-1509.	1874.		77.	77.	2.85	0.25	0.18	74.5	1.28	149.6	0	64.8	1.11	149
STIRL	28002	0.	2209.	0.	0.	-1809.	2579.		77.	163.	3.58	0.25	0.26	113.2	1.94	174.8	0	68.5	1.17	134
STIRL	28002	0.	0.	1699.	0.	189.	175.		77.	77.	5.87	0.25	0.18	129.1	2.21	259.4	12	50.9	0.87	132
STIRL	28002	0.	0.	2209.	0.	400.	370.		77.	163.	7.62	0.25	0.26	201.7	3.45	311.6	8	52.4	0.90	118
HEGT85	28002	0.	0.	1946.	0.	189.	-73.	A	77.	77.	6.80	0.25	0.06	157.8	2.70	276.6	3	59.9	1.03	117
HEGT85	28002	0.	0.	8915.	0.	2057.	-789.	A	77.	839.	30.59	0.25	0.12	808.8	13.85	309.6	0	129.0	2.21	91
HEGT60	28002	0.	0.	1909.	0.	189.	-35.	A	77.	77.	6.63	0.25	0.07	149.9	2.57	267.9	5	58.2	1.00	119
HEGT60	28002	0.	0.	3627.	0.	675.	-126.	A	77.	275.	11.17	0.25	0.13	263.9	4.52	248.4	1	66.7	1.14	93
HEGT00	28002	0.	0.	1877.	0.	189.	-3.	A	77.	77.	6.22	0.25	0.09	130.9	2.24	238.0	8	55.1	0.94	122
HEGT00	28002	0.	0.	2158.	0.	273.	-4.	A	77.	111.	6.53	0.25	0.11	144.9	2.48	229.1	7	55.2	0.95	111
FCMCCL	28002	0.	0.	1624.	0.	189.	250.		77.	77.	7.40	0.25	0.21	134.2	2.30	281.9	10	52.3	0.90	136
FCMCCL	28002	0.	0.	2227.	0.	487.	642.		77.	198.	11.12	0.25	0.34	177.8	3.04	272.4	11	47.5	0.81	123
FCSTCL	28002	0.	0.	1608.	0.	189.	266.		77.	77.	7.14	0.25	0.22	131.8	2.26	279.7	11	51.5	0.88	137
FCSTCL	28002	0.	0.	2618.	0.	708.	994.		77.	289.	13.23	0.25	0.39	211.2	3.62	275.2	12	42.2	0.72	117
IGGTST	28002	0.	0.	1706.	0.	189.	168.		77.	77.	5.19	0.25	0.17	125.?	2.15	250.7	12	50.6	0.87	131
IGGTST	28002	0.	0.	2440.	0.	487.	432.		77.	199.	5.39	0.25	0.27	169.7	2.91	237.4	13	44.7	0.77	115
GTSOAR	28002	0.	1695.	0.	0.	-1506.	1874.		77.	77.	2.30	0.25	0.18	56.5	0.97	113.8	-62	62.3	1.07	155
GTSOAR	28002	0.	2486.	0.	0.	-1967.	2974.		77.	211.	2.80	0.25	0.29	85.9	1.4?	117.9	0	64.0	1.10	137
GTAC08	28002	0.	1625.	0.	0.	-1436.	1874.		77.	77.	2.11	0.25	0.21	49.5	0.85	104.0	-10	59.1	1.01	161
GTAC08	28002	0.	2048.	0.	0.	-1651.	2571.		77.	162.	2.16	0.25	0.31	62.0	1.06	103.3	44	56.8	0.97	149
GTAC12	28002	0.	1632.	0.	0.	-1443.	1874.		77.	77.	2.20	0.25	0.21	52.8	0.90	110.3	-17	59.8	1.02	159
GTAC12	28002	0.	2271.	0.	0.	-1773.	2906.		77.	203.	2.49	0.25	0.33	74.6	1.28	112.1	10	57.3	0.98	143
GTAC16	28002	0.	1641.	0.	0.	-1451.	1874.		77.	77.	2.25	0.25	0.20	54.9	0.94	114.1	-26	60.3	1.03	158
GTAC16	28002	0.	2437.	0.	0.	-1871.	3134.		77.	231.	2.78	0.25	0.34	85.4	1.46	119.5	5	58.4	1.00	139
GTWC16	28002	0.	1678.	0.	0.	-1489.	1874.		77.	77.	2.21	0.25	0.19	53.0	0.91	107.8	-28	61.3	1.05	157
GTWC16	28002	0.	2605.	0.	0.	-2015.	3214.		77.	240.	2.66	0.25	0.32	79.9	1.37	104.7	0	61.1	1.05	137

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		------------FUEL USE IN BTU*10**6------------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
CC1626	28002	0.	1685.	0.	0.	-1496.	1874.	77.	77.	2.37	0.25	0.18	54.0	0.92	109.3	-44	61.9	1.06	157
CC1626	28002	0.	3344.	0.	0.	-2449.	4237.	77.	365.	3.50	0.25	0.35	102.7	1.76	104.7	0	62.9	1.08	126
CC1622	28002	0.	1666.	0.	0.	-1477.	1874.	77.	77.	2.38	0.25	0.19	55.3	0.95	113.2	-52	61.5	1.05	157
CC1622	28002	0.	3051.	0.	0.	-2247.	3933.	77.	328.	3.58	0.25	0.36	110.3	1.89	123.4	0	62.0	1.06	128
CC1222	28002	0.	1662.	0.	0.	-1473.	1874.	77.	77.	2.36	0.25	0.19	53.8	0.92	110.5	-36	61.2	1.05	158
CC1222	28002	0.	3025.	0.	0.	-2225.	3918.	77.	326.	3.38	0.25	0.36	99.2	1.70	112.0	0	60.1	1.03	129
CC0822	28002	0.	1634.	0.	0.	-1444.	1874.	77.	77.	2.32	0.25	0.21	52.3	0.90	109.3	-20	60.0	1.03	160
CC0822	28002	0.	2556.	0.	0.	-1923.	3360.	77.	258.	2.87	0.25	0.36	81.0	1.39	108.2	11	56.5	0.97	139
STIG15	28002	0.	1921.	0.	0.	-1731.	1874.	77.	77.	3.07	0.25	0.07	59.0	1.01	104.8	999	70.5	1.21	144
STIG15	28002	0.	81077.	0.	0.	-58875.	75570.	77.	9053.	136.27	0.25	0.17	2177.7	37.28	91.7	0	1133.9	19.42	523
STIG10	28002	0.	1859.	0.	0.	-1670.	1874.	77.	77.	2.79	0.25	0.10	56.8	0.97	104.3	151	68.0	1.17	147
STIG10	28002	0.	7955.	0.	0.	-5902.	8114.	77.	837.	11.29	0.25	0.22	214.0	3.66	91.8	0	133.6	2.29	115
STIG1S	28002	0.	1831.	0.	0.	-1642.	1874.	77.	77.	2.71	0.25	0.11	52.4	0.90	97.6	-59	66.6	1.14	151
STIG1S	28002	0.	5000.	0.	0.	-3795.	5273.	77.	491.	7.39	0.25	0.23	137.7	2.36	94.0	0	97.5	1.67	114
DEADV3	28002	0.	1779.	0.	0.	-1589.	1874.	77.	77.	3.14	0.25	0.14	86.3	1.48	165.5	0	68.9	1.18	143
DEADV3	28002	0.	5142.	0.	0.	-3771.	5830.	77.	559.	9.46	0.25	0.29	337.6	5.78	224.1	0	111.5	1.91	113
DEHTPM	28002	0.	1639.	0.	0.	-1450.	1874.	77.	77.	3.21	0.25	0.21	86.4	1.48	179.8	0	64.6	1.11	149
DEHTPM	28002	0.	2460.	0.	0.	-1882.	3176.	77.	236.	5.35	0.25	0.34	177.5	3.04	246.2	0	70.4	1.21	130
DESOA3	28002	1823.	0.	0.	-1823.	189.	1874.	77.	77.	3.46	0.25	0.12	98.9	1.69	185.1	0	85.1	1.46	144
DESOA3	28002	6164.	0.	0.	-6164.	1599.	6595.	77.	652.	13.45	0.25	0.25	494.7	8.47	273.8	0	190.1	3.26	137
DESOA3	28002	0.	1823.	0.	0.	-1634.	1874.	77.	77.	3.46	0.25	0.12	98.9	1.69	185.1	0	72.0	1.23	138
DESOA3	28002	0.	6164.	0.	0.	-4565.	6595.	77.	652.	13.45	0.25	0.25	494.7	8.47	273.8	0	145.8	2.50	118
GTSOAD	28002	1653.	0.	0.	-1653.	189.	1874.	77.	77.	2.12	0.25	0.20	49.5	0.85	102.2	-69	71.9	1.23	165
GTSOAD	28002	2288.	0.	0.	-2288.	480.	2848.	77.	196.	2.26	0.25	0.31	65.2	1.12	97.2	0	74.5	1.28	152
GTRA08	28002	1686.	0.	0.	-1686.	189.	1874.	77.	77.	2.35	0.25	0.18	58.8	1.01	119.0	999	74.4	1.27	160
GTRA08	28002	3135.	0.	0.	-3135.	804.	3933.	77.	328.	3.77	0.25	0.34	122.3	2.09	133.1	0	88.4	1.51	135
GTRA12	28002	1676.	0.	0.	-1676.	189.	1874.	77.	77.	2.32	0.25	0.19	57.5	0.99	117.1	999	73.9	1.27	161
GTRA12	28002	3044.	0.	0.	-3044.	783.	3863.	77.	319.	3.68	0.25	0.34	119.3	2.04	133.7	0	86.2	1.48	136
GTRA16	28002	1673.	0.	0.	-1673.	189.	1874.	77.	77.	2.36	0.25	0.19	59.0	1.01	120.4	999	73.9	1.27	160
GTRA16	28002	2909.	0.	0.	-2909.	730.	3683.	77.	298.	3.68	0.25	0.34	119.8	2.05	140.5	0	85.4	1.46	137
GTR208	28002	1674.	0.	0.	-1674.	189.	1874.	77.	77.	2.25	0.25	0.19	54.5	0.93	111.1	134	73.4	1.26	162
GTR208	28002	2621.	0.	0.	-2621.	603.	3258.	77.	246.	2.88	0.25	0.32	88.8	1.52	115.6	0	80.5	1.38	143
GTR212	28002	1675.	0.	0.	-1675.	189.	1874.	77.	77.	2.28	0.25	0.19	55.7	0.95	113.4	171	73.6	1.26	161
GTR212	28002	2726.	0.	0.	-2726.	647.	3405.	77.	264.	3.19	0.25	0.33	100.7	1.72	126.0	0	82.6	1.41	140
GTR216	28002	1668.	0.	0.	-1668.	189.	1874.	77.	77.	2.32	0.25	0.19	57.4	0.98	117.5	999	73.5	1.26	161
GTR216	28002	2737.	0.	0.	-2737.	663.	3460.	77.	270.	3.38	0.25	0.34	108.1	1.85	134.8	0	82.6	1.42	139
GTRW08	28002	1746.	0.	0.	-1746.	189.	1874.	77.	77.	2.29	0.25	0.15	55.7	0.95	108.8	199	76.4	1.31	158
GTRW08	28002	3800.	0.	0.	-3800.	959.	4450.	77.	391.	3.84	0.25	0.30	123.3	2.11	110.8	0	101.8	1.74	131
GTRW12	28002	1722.	0.	0.	-1722.	189.	1874.	77.	77.	2.28	0.25	0.17	55.6	0.95	110.2	188	75.4	1.29	159
GTRW12	28002	3718.	0.	0.	-3718.	973.	4496.	77.	397.	3.86	0.25	0.32	124.2	2.13	114.0	0	97.6	1.67	131
GTRW16	28002	1717.	0.	0.	-1717.	189.	1874.	77.	77.	2.30	0.25	0.17	56.6	0.97	112.5	999	75.3	1.29	159
GTRW16	28002	3506.	0.	0.	-3506.	900.	4252.	77.	367.	3.81	0.25	0.32	122.8	2.10	119.5	0	95.1	1.63	132
GTR308	28002	1769.	0.	0.	-1769.	189.	1874.	77.	77.	2.26	0.25	0.14	54 3	0.93	104.7	158	77.1	1.32	158
GTR308	28002	3286.	0.	0.	-3286.	732.	3691.	77.	299.	3.05	0.25	0.26	93.1	1.59	96.7	0	96.5	1.65	136

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTR312	28002	1710.	0.	0.	-1710.	189.	1874.	77.	77.	2.24	0.25	0.17	54.0	0.92	107.8	134	74.7	1.28	161
GTR312	28002	3180.	0.	0.	-3180.	782.	3857.	77.	319.	3.15	0.25	0.31	97.7	1.67	104.9	0	88.8	1.52	137
GTR316	28002	1712.	0.	0.	-1712.	189.	1874.	77.	77.	2.27	0.25	0.17	55.1	0.94	109.9	165	75.0	1.28	160
GTR316	28002	3158.	0.	0.	-3158.	770.	3816.	77.	314.	3.22	0.25	0.31	100.4	1.72	108.5	0	89.3	1.53	137
FCPADS	28002	1795.	0.	0.	-1795.	189.	1874.	77.	77.	10.23	0.25	0.13	81.2	1.39	154.4	0	88.9	1.52	152
FCPADS	28002	6200.	0.	0.	-6200.	1693.	6909.	77.	691.	76.70	0.25	0.28	364.3	6.24	200.5	0	233.3	4.00	161
FCMCDS	28002	1704.	0.	0.	-1704.	189.	1874.	77.	77.	9.71	0.25	0.17	84.3	1.44	168.7	0	85.2	1.46	155
FCMCDS	28002	4524.	0.	0.	-4524.	1340.	5725.	77.	546.	57.55	0.25	0.36	326.4	5.59	246.3	0	173.8	2.98	149

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28003	0.	238.	1912.	0.	0.	0.	F	97.	0.	2.88	0.35	0.	54.4	1.00	166.7	0	62.2	1.00	80
STM141	28003	0.	1431.	385.	0.	-1193.	1527.		97.	50.	1.54	0.35	0.16	35.9	0.66	93.0	-9	63.2	1.02	147
STM141	28003	0.	115.	1701.	0.	123.	211.	F	97.	50.	3.61	0.35	0.16	68.5	1.26	177.7	44	51.2	0.82	125
STM141	28003	0.	115.	1701.	0.	123.	211.	A	97.	50.	3.49	0.35	0.16	53.0	0.97	137.3	999	49.4	0.79	131
STM088	28003	0.	1407.	510.	0.	-1169.	1403.		97.	35.	1.44	0.35	0.11	32.6	0.60	88.5	-15	65.9	1.06	141
STM088	28003	0.	152.	1765.	0.	86.	147.	F	97.	35.	3.37	0.35	0.11	64.0	1.18	174.1	45	54.4	0.88	119
STM088	28003	0.	152.	1765.	0.	86.	147.	A	97.	35.	3.37	0.35	0.11	51.1	0.94	138.9	999	53.1	0.85	124
PFBSTM	28003	0.	28.	1567.	0.	210.	345.		97.	86.	6.03	0.35	0.26	68.0	1.25	157.5	66	44.5	0.72	139
TISTMT	28003	0.	1515.	0.	0.	-1277.	1912.		97.	97.	5.08	0.35	0.30	163.8	3.01	368.9	0	71.1	1.14	148
TISTMT	28003	0.	1592.	0.	0.	-1308.	2065.		97.	116.	5.34	0.35	0.32	183.1	3.38	392.4	0	72.1	1.16	139
TISTMT	28003	0.	0.	1515.	0.	238.	397.		97.	97.	7.72	0.35	0.30	212.9	3.91	479.6	6	58.8	0.95	139
TISTMT	28003	0.	0.	1592.	0.	284.	473.		97.	116.	7.82	0.35	0.32	230.5	4.24	493.9	6	58.4	0.94	131
TIHRSG	28003	0.	1557.	302.	0.	-1318.	1611.		97.	60.	4.65	0.35	0.14	164.4	3.02	382.5	0	81.1	1.31	119
TIHRSG	28003	0.	90.	1768.	0.	148.	144.		97.	60.	7.05	0.35	0.14	208.9	3.84	466.1	0	69.2	1.11	111
STIRL	28003	1692.	0.	0.	-1692.	238.	[illegible]12.		97.	97.	3.02	0.35	0.21	82.2	1.51	165.8	0	77.8	1.25	153
STIRL	28003	1985.	0.	0.	-1985.	359.	2318.		97.	147.	3.27	0.35	0.26	101.9	1.87	175.2	0	81.6	1.31	143
STIRL	28003	0.	1692.	0.	0.	-1453.	1912.		97.	97.	3.02	0.35	0.21	82.3	1.51	166.0	0	65.6	1.06	146
STIRL	28003	0.	1985.	0.	0.	-1625.	2318.		97.	147.	3.27	0.35	0.26	102.0	1.87	175.4	0	67.3	1.08	138
STIRL	28003	0.	0.	1692.	0.	238.	221.		97.	97.	6.19	0.35	0.21	143.5	2.64	289.5	12	52.6	0.85	132
STIRL	28003	0.	0.	1985.	0.	359.	333.		97.	147.	6.91	0.35	0.26	180.6	3.32	310.5	10	52.7	0.85	122
HEGT85	28003	0.	0.	2004.	0.	238.	-91.	A	97.	97.	7.28	0.35	0.07	172.4	3.17	293.6	4	63.0	1.01	116
HEGT85	28003	0.	0.	8010.	0.	1848.	-709.	A	97.	754.	28.13	0.35	0.12	749.6	13.77	319.4	0	124.6	2.01	88
HEGT60	28003	0.	0.	1957.	0.	238.	-45.	A	97.	97.	6.85	0.35	0.09	154.2	2.83	269.0	7	59.7	0.96	119
HEGT60	28003	0.	0.	3258.	0.	607.	-114.	A	97.	247.	10.27	0.35	0.13	244.7	4.50	256.3	3	66.7	1.07	99
HEGT00	28003	0.	0.	1916.	0.	238.	-4.	A	97.	97.	6.25	0.35	0.11	135.4	2.49	241.3	10	56.3	0.91	122
HEGT00	28003	0.	0.	1939.	0.	245.	-4.	A	97.	100.	6.01	0.35	0.11	134.3	2.47	236.4	10	55.8	0.90	111
FCMCCL	28003	0.	0.	1598.	0.	238.	315.		97.	97.	7.76	0.35	0.28	133.0	2.44	284.0	13	52.1	0.84	139
FCMCCL	28003	0.	0.	2001.	0.	437.	577.		97.	178.	10.16	0.35	0.34	164.3	3.02	280.2	12	49.0	0.79	129
FCSTCL	28003	0.	0.	1578.	0.	238.	334.		97.	97.	7.61	0.35	0.27	137.6	2.53	297.6	12	52.1	0.84	140
FCSTCL	28003	0.	0.	2352.	0.	637.	893.		97.	260.	12.09	0.35	0.39	195.1	3.59	283.1	13	44.4	0.71	125
IGGTST	28003	0.	0.	1701.	0.	238.	211.		97.	97.	4.95	0.35	0.21	123.0	2.26	246.8	15	50.0	0.81	133
IGGTST	28003	0.	0.	2192.	0.	438.	388.		97.	179.	5.00	0.35	0.27	155.7	2.86	242.5	14	46.4	0.75	121
GTSOAR	28003	0.	1687.	0.	0.	-1449.	1912.		97.	97.	2.26	0.35	0.22	55.1	1.01	111.4	999	61.8	0.99	157
GTSOAR	28003	0.	2233.	0.	0.	-1768.	2673.		97.	190.	2.45	0.35	0.29	73.1	1.34	111.7	2	62.6	1.01	143
GTAC08	28003	0.	1599.	0.	0.	-1360.	1912.		97.	97.	2.11	0.35	0.26	50.3	0.92	107.4	999	58.4	0.94	163
GTAC08	28003	0.	1840.	0.	0.	-1483.	2310.		97.	146.	2.02	0.35	0.31	57.3	1.05	106.2	167	56.9	0.92	153
GTAC12	28003	0.	1608.	0.	0.	-1369.	1912.		97.	97.	2.20	0.35	0.25	53.5	0.98	113.5	999	59.1	0.95	161
GTAC12	28003	0.	2040.	0.	0.	-1593.	2611.		97.	182.	2.32	0.35	0.33	68.6	1.26	114.8	26	57.4	0.92	149
GTAC16	28003	0.	1619.	0.	0.	-1380.	1912.		97.	97.	2.21	0.35	0.25	53.6	0.99	113.1	999	59.5	0.96	160
GTAC16	28003	0.	2190.	0.	0.	-1681.	2816.		97.	207.	2.58	0.35	0.34	78.5	1.44	122.3	16	58.4	0.94	145
GTWC16	28003	0.	1666.	0.	0.	-1427.	1912.		97.	97.	2.16	0.35	0.23	51.0	0.94	104.4	999	60.6	0.98	159
GTWC16	28003	0.	2340.	0.	0.	-1810.	2888.		97.	216.	2.49	0.35	0.32	74.0	1.36	107.9	10	60.8	0.98	143
CC1626	28003	0.	1674.	0.	0.	-1436.	1912.		97.	97.	2.42	0.35	0.22	55.7	1.02	113.6	22	61.8	0.99	157

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
CC1626	28003	0.	3005.	0.	0.	-2201.	3807.	97.	328.	3.27	0.35	0.35	95.0	1.74	107.8	4	62.6	1.01	133
CC1622	28003	0.	1651.	0.	0.	-1412.	1912.	97.	97.	2.44	0.35	0.23	57.6	1.06	119.1	21	61.3	0.99	157
CC1622	28003	0.	2741.	0.	0.	-2019.	3534.	97.	295.	3.23	0.35	0.36	97.5	1.79	121.4	7	61.2	0.98	136
CC1222	28003	0.	1646.	0.	0.	-1408.	1912.	97.	97.	2.42	0.35	0.23	55.8	1.03	115.7	51	60.9	0.98	158
CC1222	28003	0.	2718.	0.	0.	-1999.	3520.	97.	293.	3.15	0.35	0.36	91.3	1.68	114.6	9	60.0	0.97	137
CC0822	28003	0.	1610.	0.	0.	-1371.	1912.	97.	97.	2.28	0.35	0.25	50.5	0.93	107.0	999	59.0	0.95	162
CC0822	28003	0.	2297.	0.	0.	-1728.	3019.	97.	232.	2.61	0.35	0.36	71.9	1.32	106.9	24	56.3	0.91	146
STIG15	28003	0.	1971.	0.	0.	-1733.	1912.	97.	97.	3.32	0.35	0.08	61.5	1.13	106.4	0	72.6	1.17	142
STIG15	28003	0.	72846.	0.	0.	-52898.	67898.	97.	8134.	122.67	0.35	0.17	1960.1	36.02	91.8	0	1025.1	16.49	450
STIG10	28003	0.	1894.	0.	0.	-1655.	1912.	97.	97.	2.89	0.35	0.12	55.5	1.02	100.1	999	69.1	1.11	147
STIG10	28003	0.	7147.	0.	0.	-5302.	7290.	97.	752.	10.23	0.35	0.22	193.4	3.55	92.3	0	125.9	2.03	112
STIG1S	28003	0.	1858.	0.	0.	-1620.	1912.	97.	97.	2.89	0.35	0.14	54.1	1.00	99.4	166	67.8	1.09	150
STIG1S	28003	0.	4492.	0.	0.	-3410.	4738.	97.	441.	6.71	0.35	0.23	124.6	2.29	94.6	0	93.4	1.50	117
DEADV3	28003	0.	1792.	0.	0.	-1554.	1912.	97.	97.	3.31	0.35	0.17	92.4	1.70	176.0	0	70.2	1.13	142
DEADV3	28003	0.	4620.	0.	0.	-3388.	5238.	97.	502.	8.86	0.35	0.29	315.2	5.79	232.8	0	107.4	1.73	115
DEHTPM	28003	0.	1617.	0.	0.	-1379.	1912.	97.	97.	3.40	0.35	0.25	93.4	1.72	197.2	0	64.8	1.04	150
DEHTPM	28003	0.	2210.	0.	0.	-1691.	2853.	97.	212.	4.87	0.35	0.34	160.0	2.94	247.0	0	69.0	1.11	136
DESOA3	28003	1848.	0.	0.	-1848.	238.	1912.	97.	97.	3.71	0.35	0.14	108.3	1.99	199.9	0	87.3	1.41	142
DESOA3	28003	5539.	0.	0.	-5539.	1437.	5925.	97.	586.	12.17	0.35	0.25	445.1	8.18	274.2	0	176.6	2.84	132
DESOA3	28003	0.	1848.	0.	0.	-1610.	1912.	97.	97.	3.71	0.35	0.14	108.3	1.99	199.9	0	74.0	1.19	137
DESOA3	28003	0.	5539.	0.	0.	-4102.	5925.	97.	586.	12.17	0.35	0.25	445.1	8.18	274.2	0	136.8	2.20	116
GTSOAD	28003	1634.	0.	0.	-1634.	238.	1912.	97.	97.	2.11	0.35	0.24	49.5	0.91	103.3	-74	71.2	1.15	166
GTSOAD	28003	2056.	0.	0.	-2056.	432.	2559.	97.	176.	2.11	0.35	0.31	60.1	1.10	99.8	0	72.8	1.17	156
GTRA08	28003	1676.	0.	0.	-1676.	238.	1912.	97.	97.	2.42	0.35	0.22	61.2	1.12	124.5	0	74.3	1.20	160
GTRA08	28003	2816.	0.	0.	-2816.	723.	3533.	97.	295.	3.46	0.35	0.34	111.0	2.04	134.5	0	85.2	1.37	140
GTRA12	28003	1663.	0.	0.	-1663.	238.	1912.	97.	97.	2.38	0.35	0.23	59.9	1.10	122.9	0	73.7	1.19	161
GTRA12	28003	2735.	0.	0.	-2735.	704.	3470.	97.	287.	3.37	0.35	0.34	107.7	1.98	134.3	0	83.2	1.34	142
GTRA16	28003	1659.	0.	0.	-1659.	238.	1912.	97.	97.	2.48	0.35	0.23	63.8	1.17	131.2	0	74.0	1.19	160
GTRA16	28003	2613.	0.	0.	-2613.	656.	3309.	97.	267.	3.37	0.35	0.34	108.2	1.99	141.3	0	82.5	1.33	143
GTR208	28003	1660.	0.	0.	-1660.	238.	1912.	97.	97.	2.26	0.35	0.23	55.4	1.02	113.8	999	73.0	1.17	163
GTR208	28003	2355.	0.	0.	-2355.	542.	2928.	97.	221.	2.63	0.35	0.32	79.6	1.46	115.4	0	78.0	1.26	149
GTR212	28003	1662.	0.	0.	-1662.	238.	1912.	97.	97.	2.30	0.35	0.23	56.7	1.04	116.4	0	73.2	1.18	162
GTR212	28003	2449.	0.	0.	-2449.	581.	3059.	97.	237.	2.79	0.35	0.33	85.8	1.58	119.6	0	79.3	1.28	147
GTR216	28003	1652.	0.	0.	-1652.	238.	1912.	97.	97.	2.35	0.35	0.23	58.8	1.08	121.5	0	73.1	1.18	162
GTR216	28003	2459.	0.	0.	-2459.	596.	3108.	97.	243.	2.96	0.35	0.34	92.3	1.70	128.1	0	79.3	1.28	146
GTRW03	28003	1751.	0.	0.	-1751.	238.	1912.	97.	97.	2.34	0.35	0.19	57.5	1.06	112.0	0	76.8	1.24	158
GTRW08	28003	3414.	0.	0.	-3414.	861.	3998.	97.	351.	3.53	0.35	0.30	111.9	2.06	111.9	0	97.3	1.57	135
GTRW12	28003	1721.	0.	0.	-1721.	238.	1912.	97.	97.	2.33	0.35	0.20	57.4	1.06	113.9	0	75.6	1.22	159
GTRW12	28003	3340.	0.	0.	-3340.	874.	4040.	97.	356.	3.54	0.35	0.32	112.7	2.07	115.1	0	93.5	1.50	136
GTRW16	28003	1715.	0.	0.	-1715.	238.	1912.	97.	97.	2.36	0.35	0.20	58.5	1.08	116.5	0	75.5	1.21	159
GTRW16	28003	3150.	0.	0.	-3150.	808.	3820.	97.	330.	3.29	0.35	0.32	103.3	1.90	111.9	0	90.2	1.45	139
GTR308	28003	1780.	0.	0.	-1780.	238.	1912.	97.	97.	2.30	0.35	0.17	55.7	1.02	106.8	999	77.7	1.25	157
GTR308	28003	2952.	0.	0.	-2952.	658.	3316.	97.	268.	2.85	0.35	0.26	86.1	1.58	99.6	0	92.7	1.49	141
GTR312	28003	1706.	0.	0.	-1706.	238.	1912.	97.	97.	2.28	0.35	0.21	55.4	1.02	110.9	999	74.8	1.20	161

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTR312	28003	2857.	0.	0.	-2857.	702.	3465.	97.	286.	2.89	0.35	0.31	88.2	1.62	105.3	0	85.5	1.38	143
GTR316	28003	1708.	0.	0.	-1708.	238.	1912.	97.	97.	2.31	0.35	0.21	56.7	1.04	113.3	0	75.0	1.21	160
GTR316	28003	2838.	0.	0.	-2838.	691.	3429.	97.	282.	2.95	0.35	0.31	90.7	1.67	109.1	0	86.0	1.38	143
FCPADS	28003	1812.	0.	0.	-1812.	238.	1912.	97.	97.	12.29	0.35	0.16	86.0	1.58	162.0	0	92.2	1.48	151
FCPADS	28003	5571.	0.	0.	-5571.	1521.	6208.	97.	620.	68.95	0.35	0.28	327.9	6.03	200.9	0	215.3	3.46	153
FCMCDS	28003	1698.	0.	0.	-1698.	238.	1912.	97.	97.	11.63	0.35	0.21	89.5	1.64	179.8	0	87.4	1.41	155
FCMCDS	28003	4064.	0.	0.	-4064.	1204.	5143.	97.	491.	51.89	0.35	0.36	299.7	5.51	251.6	0	162.7	2.62	147

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28121	0.	294.	1297.	0.	0.	0.	F	120.	0.	1.20	1.55	0.	18.9	1.00	207.1	0	48.1	1.00	80
STM141	28121	0.	635.	835.	0.	-340.	462.		120.	18.	0.75	1.55	0.08	12.5	0.66	110.4	909	47.3	0.98	124
STM141	28121	0.	249.	1220.	0.	45.	77.	F	120.	18.	1.56	1.53	0.08	25.3	1.34	223.9	35	44.5	0.92	104
STM141	28121	0.	249.	1220.	0.	45.	77.	A	120.	18.	1.40	1.55	0.08	18.5	0.98	163.7	999	43.6	0.91	111
STM088	28121	0.	628.	872.	0.	-333.	425.		120.	14.	0.72	1.55	0.06	11.2	0.59	104.6	-4	48.0	1.00	122
STM088	28121	0.	261.	1239.	0.	34.	58.	F	120.	14.	1.47	1.55	0.06	23.4	1.24	217.8	36	45.4	0.94	101
STM088	28121	0.	261.	1239.	0.	34.	58.	A	120.	14.	1.35	1.55	0.06	17.5	0.93	163.0	999	44.6	0.93	108
PFBSTM	28121	0.	225.	1181.	0.	70.	116.		120.	28.	2.32	1.55	0.12	30.4	1.61	242.2	27	43.3	0.90	109
TISTMT	28121	0.	668.	677.	0.	-374.	620.		120.	37.	2.31	1.55	0.15	72.8	3.85	533.0	0	51.6	1.07	106
TISTMT	28121	0.	202.	1144.	0.	92.	153.		120.	37.	3.30	1.55	0.15	92.2	4.87	674.9	4	48.6	1.01	102
TIHRSG	28121	0.	658.	848.	0.	-364.	449.		120.	17.	1.89	1.55	0.05	61.9	3.27	522.3	0	54.7	1.14	89
TIHRSG	28121	0.	253.	1253.	0.	41.	44.		120.	17.	2.80	1.55	0.05	79.5	4.20	669.9	0	52.5	1.09	84
STIRL	28121	563.	190.	635.	-563.	105.	662.		120.	43.	1.21	1.55	0.13	30.3	1.60	183.5	0	51.1	1.06	119
STIRL	28121	0.	753.	635.	0.	-459.	662.		120.	43.	1.22	1.55	0.13	30.3	1.60	183.7	11	47.1	0.98	117
STIRL	28121	0.	190.	1198.	0.	105.	99.		120.	43.	2.37	1.55	0.13	53.0	2.80	321.0	14	43.4	0.90	104
HEGT85	28121	0.	0.	1348.	0.	294.	-51.	A	120.	120.	6.08	1.55	0.15	154.6	8.17	391.5	5	47.0	0.98	115
HEGT85	28121	0.	0.	1661.	0.	383.	-66.	A	120.	156.	6.74	1.55	0.16	178.6	9.44	366.9	4	48.8	1.01	106
HEGT60	28121	0.	138.	1301.	0.	156.	-4.	A	120.	64.	3.66	1.55	0.10	93.7	4.95	381.5	6	47.3	0.98	99
HEGT00	28121	0.	227.	1294.	0.	68.	3.	A	120.	28.	2.29	1.55	0.04	54.0	2.85	344.1	5	48.0	1.00	91
FCMCCL	28121	0.	172.	1135.	0.	122.	162.		120.	50.	3.54	1.55	0.18	64.8	3.43	395.7	11	43.7	0.91	110
FCSTCL	28121	0.	100.	1021.	0.	195.	276.		120.	79.	4.42	1.55	0.30	80.2	4.24	398.0	14	38.9	0.81	123
IGGTST	28121	0.	157.	1169.	0.	137.	128.		120.	56.	2.33	1.55	0.17	62.6	3.31	333.2	14	41.8	0.87	109
GTSOAR	28121	0.	780.	557.	0.	-485.	740.		120.	52.	0.97	1.55	0.16	23.2	1.22	129.0	52	44.6	0.93	128
GTAC08	28121	0.	710.	650.	0.	-416.	647.		120.	41.	0.82	1.55	0.15	18.2	0.96	120.2	999	44.6	0.93	129
GTAC12	28121	0.	739.	587.	0.	-444.	730.		120.	51.	0.92	1.55	0.18	21.5	1.14	128.8	110	43.4	0.90	131
GTAC16	28121	0.	761.	513.	0.	-467.	784.		120.	58.	1.00	1.55	0.20	24.5	1.29	137.4	57	42.8	0.89	131
GTWC16	28121	0.	801.	488.	0.	-507.	808.		120.	61.	1.00	1.55	0.19	24.0	1.27	125.0	57	43.3	0.90	131
CC1626	28121	0.	929.	168.	0.	-635.	1129.		120.	100.	1.42	1.55	0.31	33.1	1.75	128.5	38	38.9	0.81	140
CC1622	28121	0.	876.	249.	0.	-582.	1048.		120.	90.	1.37	1.55	0.29	32.8	1.73	139.6	37	39.6	0.82	138
CC1222	28121	0.	870.	252.	0.	-576.	1045.		120.	89.	1.35	1.55	0.29	31.1	1.64	133.3	42	39.3	0.82	139
CC0822	28121	0.	791.	399.	0.	-497.	898.		120.	71.	1.19	1.55	0.25	25.9	1.37	131.7	57	40.7	0.85	137
STIG15	28121	0.	1370.	0.	0.	-1076.	1297.		120.	120.	2.97	1.55	0.14	45.9	2.43	114.5	0	50.2	1.04	129
STIG15	28121	0.	20385.	0.	0.	-14802.	19000.		120.	2276.	34.93	1.55	0.17	565.4	29.89	94.7	0	301.7	6.27	196
STIG10	28121	0.	1274.	0.	0.	-980.	1297.		120.	120.	2.49	1.55	0.20	42.5	2.25	113.9	10	46.4	0.96	136
STIG10	28121	0.	2000.	0.	0.	-1484.	2040.		120.	210.	3.38	1.55	0.22	62.8	3.32	107.2	0	54.1	1.12	122
STIG1S	28121	0.	1230.	0.	0.	-936.	1297.		120.	120.	2.33	1.55	0.23	39.5	2.09	109.6	16	44.5	0.93	140
STIG1S	28121	0.	1257.	0.	0.	-954.	1326.		120.	124.	2.26	1.55	0.23	39.7	2.10	107.7	16	44.6	0.93	130
DEADV3	28121	0.	1134.	0.	0.	-840.	1297.		120.	120.	2.76	1.55	0.29	81.0	4.28	243.8	7	46.4	0.96	138
DEADV3	28121	0.	1222.	0.	0.	-896.	1403.		120.	133.	2.80	1.55	0.29	87.7	4.63	244.8	6	47.3	0.98	127
DEHTPM	28121	0.	761.	485.	0.	-467.	812.		120.	61.	1.70	1.55	0.22	46.1	2.43	255.0	13	44.9	0.93	122
DESOA3	28121	1202.	0.	0.	-1202.	294.	1297.		120.	120.	3.31	1.55	0.24	101.0	5.34	286.8	0	59.5	1.24	137
DESOA3	28121	1449.	0.	0.	-1449.	376.	1571.		120.	153.	3.77	1.55	0.26	124.9	6.60	294.0	0	65.3	1.36	128
DESOA3	28121	0.	1202.	0.	0.	-908.	1297.		120.	120.	3.31	1.55	0.24	101.0	5.34	286.8	1	51.1	1.06	133

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
DESOA3	28121	0.	1449.	0.	0.	-1073.	1571.	120.	153.	3.77	1.55	0.26	124.9	6.60	294.0	0	55.2	1.15	123
GTSOAD	28121	572.	174.	584.	-572.	120.	713.	120.	49.	0.86	1.55	0.16	19.0	1.00	113.3	999	47.8	0.99	134
GTRA08	28121	762.	99.	3?0.	-762.	196.	967.	120.	80.	1.26	1.55	0.25	33.4	1.77	149.6	11	46.9	0.97	136
GTRA12	28121	745.	103.	3[illegible].	-745.	192.	953.	120.	78.	1.22	1.55	0.25	31.9	1.68	146.0	13	46.5	0.97	136
GTRA16	28121	715.	115.	385.	-715.	179.	912.	120.	73.	1.22	1.55	0.24	32.1	1.70	153.2	11	47.0	0.98	134
GTR208	28121	648.	145.	486.	-648.	149.	811.	120.	61.	1.03	1.55	0.20	25.1	1.33	132.3	11	47.6	0.99	133
GTR212	28121	674.	134.	450.	-674.	160.	847.	120.	65.	1.09	1.55	0.21	27.1	1.43	137.3	11	47.4	0.99	134
GTR216	28121	676.	130.	437.	-676.	164.	860.	120.	67.	1.13	1.55	0.22	29.0	1.53	146.3	11	47.2	0.98	133
GTRW08	28121	927.	60.	202.	-927.	234.	1095.	120.	95.	1.29	1.55	0.25	33.5	1.77	123.2	5	48.0	1.00	137
GTRW12	28121	912.	56.	186.	-912.	239.	1111.	120.	97.	1.30	1.55	0.27	33.8	1.78	126.5	11	46.9	0.97	139
GTRW16	28121	865.	72.	242.	-865.	222.	1055.	120.	90.	1.28	1.55	0.26	33.5	1.77	132.4	9	47.3	0.98	137
GTR308	28121	802.	116.	387.	-802.	179.	910.	120.	73.	1.12	1.55	0.18	27.5	1.45	116.9	0	49.8	1.04	132
GTR312	28121	791.	100.	335.	-791.	194.	962.	120.	79.	1.14	1.55	0.23	28.5	1.51	123.2	10	47.5	0.99	137
GTR316	28121	786.	103.	344.	-786.	191.	953.	120.	78.	1.17	1.55	0.23	29.5	1.56	127.9	7	47.8	0.99	135
FCPADS	28121	1174.	0.	0.	1174.	294.	1297.	120.	120.	13.64	1.55	0.26	74.0	3.91	215.0	0	65.9	1.37	146
FCPADS	28121	1559.	0.	0.	-1559.	426.	1737.	120.	174.	19.18	1.55	0.28	100.9	5.33	220.9	0	78.4	1.63	139
FCMCDS	28121	1033.	0.	0.	-1033.	294.	1297.	120.	120.	12.79	1.55	0.35	78.0	4.12	257.5	0	60.2	1.25	153
FCMCDS	28121	1137.	0.	0.	-1137.	337.	1439.	120.	137.	14.36	1.55	0.36	86.6	4.58	259.8	0	63.2	1.31	144

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REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28191	0.	74.	1402.	0.	0.	0.	F	30.	0.	2.89	0.11	0.	55.7	1.00	164.8	0	38.2	1.00	90
STM141	28191	0.	1275.	0.	0.	-1200.	1402.		30.	30.	1.73	0.11	0.14	34.8	0.62	93.1	-19	43.2	1.13	163
STM141	28191	0.	1291.	0.	0.	-1207.	1436.		30.	35.	1.48	0.11	0.15	33.8	0.61	89.2	-17	42.6	1.11	154
STM141	28191	0.	0.	1275.	0.	74.	127.	F	30.	30.	3.93	0.11	0.14	70.8	1.27	189.7	22	33.5	0.88	138
STM141	28191	0.	0.	1291.	0.	85.	145.	F	30.	35.	3.46	0.11	0.15	66.0	1.19	174.4	36	32.0	0.84	130
STM141	28191	0.	0.	1275.	0.	74.	127.	A	30.	30.	3.65	0.11	0.14	51.8	0.93	136.7	999	31.2	0.82	144
STM141	28191	0.	0.	1291.	0.	85.	145.	A	30.	35.	3.31	0.11	0.15	50.7	0.91	134.0	999	30.2	0.79	136
STM088	28191	0.	1258.	85.	0.	-1184.	1317.		30.	20.	1.38	0.11	0.09	30.1	0.54	83.4	-19	44.4	1.16	149
STM088	28191	0.	25.	1318.	0.	49.	84.	F	30.	20.	3.22	0.11	0.09	61.2	1.10	169.5	41	34.3	0.90	124
STM088	28191	0.	25.	1318.	0.	49.	84.	A	30.	20.	3.19	0.11	0.09	48.5	0.87	134.3	999	32.9	0.86	129
PFBSTM	28191	0.	0.	1283.	0.	74.	119.		30.	30.	4.73	0.11	0.13	65.4	1.17	173.9	28	33.8	0.89	140
PFBSTM	28191	0.	0.	1452.	0.	171.	274.		30.	70.	5.68	0.11	0.23	65.7	1.18	154.4	44	30.3	0.79	131
TISTMT	28191	0.	1278.	0.	0.	-1204.	1402.		30.	30.	3.26	0.11	0.13	92.9	1.67	247.9	0	51.1	1.34	143
TISTMT	28191	0.	1561.	0.	0.	-1320.	1962.		30.	99.	5.21	0.11	0.29	178.6	3.21	390.4	0	57.9	1.52	129
TISTMT	28191	0.	0.	1278.	0.	74.	123.		30.	30.	5.50	0.11	0.13	132.5	2.38	353.8	0	41.8	1.09	130
TISTMT	28191	0.	0.	1561.	0.	242.	401.		30.	99.	7.59	0.11	0.29	225.3	4.05	492.5	0	46.0	1.20	118
TIHRSG	28191	0.	1373.	0.	0.	-1299.	1402.		30.	30.	3.61	0.11	0.07	111.4	2.00	276.9	0	56.0	1.47	135
TIHRSG	28191	0.	1647.	0.	0.	-1480.	1711.		30.	68.	5.06	0.11	0.12	180.1	3.23	373.1	0	65.7	1.72	121
TIHRSG	28191	0.	0.	1373.	0.	74.	28.		30.	30.	5.95	0.11	0.07	150.8	2.71	374.6	0	45.9	1.20	123
TIHRSG	28191	0.	0.	1647.	0.	167.	64.		30.	68.	7.62	0.11	0.12	228.7	4.11	473.8	0	53.6	1.40	110
STIRL	28191	1343.	0.	0.	-1343.	74.	1402.		30.	30.	2.21	0.11	0.09	53.2	0.96	135.2	999	56.5	1.48	155
STIRL	28191	1917.	0.	0.	-1917.	299.	2155.		30.	122.	3.16	0.11	0.22	97.8	1.76	174.1	0	65.8	1.72	130
STIRL	28191	0.	1343.	0.	0.	-1268.	1402.		30.	30.	2.21	0.11	0.09	53.2	0.96	135.3	119	47.6	1.24	149
STIRL	28191	0.	1917.	0.	0.	-1618.	2155.		30.	122.	3.16	0.11	0.22	97.9	1.76	174.4	0	53.0	1.39	121
STIRL	28191	0.	0.	1343.	0.	74.	59.		30.	30.	4.53	0.11	0.09	93.4	1.68	237.4	6	37.5	0.98	129
STIRL	28191	0.	0.	1917.	0.	299.	238.		30.	122.	6.61	0.11	0.22	174.8	3.14	311.2	3	40.8	1.07	103
HEGT60	28191	0.	0.	1485.	0.	74.	-84.	A	30.	30.	4.79	0.11	-0.01	103.9	1.87	238.8	0	41.6	1.09	117
HEGT60	28191	0.	0.	6901.	0.	1285.	-1447.	A	30.	524.	20.38	0.11	-0.02	508.6	9.14	251.5	0	101.2	2.65	64
HEGT00	28191	0.	0.	1421.	0.	74.	-19.	A	30.	30.	4.67	0.11	0.04	98.4	1.77	236.2	1	39.7	1.04	123
HEGT00	28191	0.	0.	2121.	0.	268.	-70.	A	30.	109.	6.28	0.11	0.09	143.1	2.57	230.3	0	43.4	1.13	94
FCMCCL	28191	0.	0.	1305.	0.	74.	97.		30.	30.	5.07	0.11	0.12	99.5	1.79	260.3	4	38.5	1.01	131
FCMCCL	28191	0.	0.	2083.	0.	456.	593.		30.	186.	10.12	0.11	0.33	169.3	3.04	277.2	7	35.5	0.93	105
FCSTCL	28191	0.	0.	1299.	0.	74.	103.		30.	30.	5.04	0.11	0.12	98.3	1.77	268.2	5	38.3	1.00	132
FCSTCL	28191	0.	0.	2311.	0.	590.	817.		30.	241.	11.42	0.11	0.38	190.4	3.42	281.1	8	32.7	0.86	103
IGGTST	28191	0.	0.	1341.	0.	74.	60.		30.	30.	4.34	0.11	0.09	94.1	1.69	239.3	6	37.6	0.99	129
IGGTST	28191	0.	0.	2151.	0.	393.	319.		30.	160.	4.89	0.11	0.25	151.4	2.72	240.1	8	34.2	0.89	96
GTSOAR	28191	0.	1350.	0.	0.	-1276.	1402.		30.	30.	1.86	0.11	0.09	42.8	0.77	106.1	-35	46.3	1.21	153
GTSOAR	28191	0.	2577.	0.	0.	-2040.	2951.		30.	219.	2.85	0.11	0.26	87.7	1.58	116.2	0	52.9	1.39	116
GTAC08	28191	0.	1303.	0.	0.	-1229.	1402.		30.	30.	1.81	0.11	0.12	40.8	0.73	106.7	-27	44.7	1.17	157
GTAC08	28191	0.	1900.	0.	0.	-1532.	2388.		30.	150.	2.06	0.11	0.31	58.9	1.06	105.8	0	42.0	1.10	132
GTAC12	28191	0.	1307.	0.	0.	-1233.	1402.		30.	30.	1.82	0.11	0.11	41.5	0.74	108.2	-29	44.9	1.17	157
GTAC12	28191	0.	2114.	0.	0.	-1650.	2704.		30.	189.	2.38	0.11	0.33	70.8	1.27	114.3	0	42.6	1.12	126
GTAC16	28191	0.	1315.	0.	0.	-1240.	1402.		30.	30.	1.84	0.11	0.11	42.3	0.76	109.9	-31	45.2	1.18	156

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTAC16	28191	0.	2332.	0.	0.	-1791.	2966.	30.	221.	2.70	0.11	0.33	82.5	1.48	120.7	0	44.6	1.17	121
GTWC16	28191	0.	1324.	0.	0.	-1250.	1402.	30.	30.	1.84	0.11	0.10	42.1	0.76	108.5	-31	45.5	1.19	155
GTWC16	28191	0.	2416.	0.	0.	-1869.	2984.	30.	223.	2.54	0.11	0.32	76.0	1.36	107.3	0	45.9	1.20	121
CC1626	28191	0.	1330.	0.	0.	-1256.	1402.	30.	30.	1.94	0.11	0.10	41.9	0.75	107.5	-34	45.8	1.20	155
CC1626	28191	0.	2949.	0.	0.	-2196.	3673.	30.	307.	3.18	0.11	0.33	91.8	1.65	106.2	0	48.4	1.27	118
CC1622	28191	0.	1323.	0.	0.	-1248.	1402.	30.	30.	1.93	0.11	0.10	42.0	0.75	108.3	-33	45.6	1.19	155
CC1622	28191	0.	2693.	0.	0.	-2019.	3411.	30.	275.	3.14	0.11	0.34	94.1	1.69	119.2	0	47.1	1.23	118
CC1222	28191	0.	1321.	0.	0.	-1247.	1402.	30.	30.	1.92	0.11	0.10	41.3	0.74	106.7	-32	45.5	1.19	156
CC1222	28191	0.	2667.	0.	0.	-1998.	3392.	30.	273.	3.06	0.11	0.34	88.2	1.58	112.8	0	46.0	1.20	119
CC0822	28191	0.	1310.	0.	0.	-1235.	1402.	30.	30.	1.92	0.11	0.11	41.1	0.74	107.0	-30	45.1	1.18	157
CC0822	28191	0.	2253.	0.	0.	-1732.	2900.	30.	213.	2.53	0.11	0.34	69.1	1.24	104.7	0	42.4	1.11	125
DEHTPM	26191	0.	1342.	0.	0.	-1268.	1402.	30.	30.	2.41	0.11	0.09	59.3	1.07	150.9	0	48.4	1.27	147
DEHTPM	26191	0.	2269.	0.	0.	-1830.	2621.	30.	179.	5.05	0.11	0.26	166.7	3.00	250.8	0	61.9	1.62	114
GTSOAD	28191	1318.	0.	0.	-1318.	74.	1402.	30.	30.	1.79	0.11	0.11	40.2	0.72	104.0	-52	53.9	1.41	162
GTSOAD	28191	2162.	0.	0.	-2162.	454.	2672.	30.	185.	2.18	0.11	0.31	62.6	1.12	96.8	0	58.2	1.52	136
GTRA08	28191	1350.	0.	0.	-1350.	74.	1402.	30.	30.	1.95	0.11	0.09	46.9	0.84	118.5	-88	55.9	1.46	157
GTRA08	28191	3622.	0.	0.	-3622.	929.	4264.	30.	379.	4.18	0.11	0.30	137.3	2.47	129.3	0	84.6	2.21	129
GTRA12	28191	1343.	0.	0	-1343.	74.	1402.	30.	30.	1.88	0.11	0.09	43.8	0.79	111.4	-68	55.2	1 44	159
GTRA12	28191	3360.	0.	0.	-3360	864.	4047.	30.	353.	3.91	0.11	0.32	127.5	2.29	129.5	0	78.7	2.06	129
GTRA16	28191	1339.	0.	0.	-1339.	74.	1402.	30.	30.	1.90	0.11	0.09	44.6	0.80	113.7	-71	55.2	1.44	159
GTRA16	28191	3103.	0.	0.	-3103.	778.	3759.	30.	317.	3.83	0.11	0.32	125.1	2.25	137.5	0	75.7	1.98	127
GTR208	28191	1336.	0.	0.	-1336.	74.	1402.	30.	30.	1.85	0.11	0.09	42.6	0.76	108.7	-61	54.8	1.43	160
GTR208	28191	2660.	0.	0.	-2660.	612.	3201.	30.	250.	3.02	0.11	0.30	94.1	1.69	120.7	0	68.3	1.79	128
GTR212	28191	1336.	0.	0.	-1336.	74.	1402.	30.	30.	1.86	0.11	0.09	43.1	0.77	110.1	-64	54.9	1.44	160
GTR212	28191	2772.	0.	0.	-2772.	657.	3354.	30.	268.	3.22	0.11	0.31	101.6	1.83	125.1	0	69.8	1.83	128
GTR216	28191	1333.	0.	0.	-1333.	74.	1402.	30.	30.	1.88	0.11	0.10	43.8	0.79	112.1	-66	54.9	1.44	159
GTR216	28191	2801.	0.	0.	-2801.	678.	3424.	30.	277.	3.42	0.11	0.32	109.7	1.97	133.6	0	70.3	1.84	127
GTRW08	28191	1368.	0.	0.	-1368.	74.	1402.	30.	30.	1.95	0.11	0.07	46.7	0.84	116.5	-89	56.5	1.48	156
GTRW08	28191	4275.	0.	0.	-4275.	1078.	4763.	30.	440.	4.12	0.11	0.27	132.9	2.39	106.1	0	96.3	2.52	133
GTRW12	28191	1355.	0.	0.	-1355.	74.	1402.	30.	30.	1.95	0.11	0.08	46.7	0.84	117.5	-87	56.0	1.47	157
GTRW12	28191	4012.	0.	0.	-4012.	1050.	4667.	30.	428.	4.03	0.11	0.30	130.3	2.34	110.8	0	88.[illegible]	2.3?	132
GTRW16	28191	1351.	0.	0.	-1351.	74.	1402.	30.	30.	1.96	0.11	0.08	47.2	0.85	119.3	-91	56.0	1.46	157
GTRW16	28191	3641.	0.	0.	-3641.	934.	4281.	30.	381.	3.89	0.11	0.30	125.7	2.26	117.8	0	83.4	2.18	130
GTR308	28191	1378.	0.	0.	-1378.	74.	1402.	30.	30.	1.86	0.11	0.07	42.6	0.77	105.5	-66	56.3	1.47	157
GTR308	28191	3544.	0.	0.	-3544.	790.	3797.	30.	322.	3.34	0.11	0.23	104.0	1.87	100.2	0	88.1	2.31	128
GTR312	28191	1343.	0.	0.	-1343.	74.	1402.	30.	30.	1.85	0.11	0.09	42.5	0.76	108.0	-62	55.1	1.44	159
GTR312	28191	3115.	0.	0.	-3115.	766.	3716.	30.	312.	3.11	0.11	0.31	96.3	1.73	105.5	0	73.3	1.92	130
GTR316	28191	1314.	0.	0.	-1344.	74.	1402.	30.	30.	1.86	0.11	0.09	43.1	0.78	109.5	-65	55.2	1.44	159
GTR316	28191	3085.	0.	0.	-3085.	752.	3670.	30.	307.	3.17	0.11	0.30	98.8	1.78	109.3	0	73.6	1.93	129
FCPADS	28191	1371.	0.	0.	-1371.	74.	1402.	30.	30.	4.74	0.11	0.07	54.8	0.99	136.5	999	60.3	1.58	154
FCPADS	28191	5765.	0.	0.	-5765.	1574.	6424.	30.	642.	66.90	0.11	0.28	339.4	6.10	200.9	0	196.9	5.15	188
FCMCDS	28191	1335.	0.	0.	-1335.	74.	1402.	30.	30.	4.55	0.11	0.10	55.8	1.00	142.7	999	58.9	1.54	156
FCMCDS	28191	4206.	0.	0.	-4206.	1246.	5323.	30.	506.	50.30	0.11	0.36	304.0	5.46	246.7	0	145.2	3.80	165

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

ECS	PROCS	FUEL USE IN BTU*10**6 — **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28192	0.	149.	2804.	0.	0.	0.	F	61.	0.	5.16	0.11	0.	110.4	1.00	163.3	0	75.7	1.00	80
STM141	28192	0.	2550.	0.	0.	-2402.	2804.		61.	61.	2.59	0.11	0.14	60.9	0.55	81.5	-16	84.7	1.12	166
STM141	28192	0.	2584.	0.	0.	-2415.	2874.		61.	69.	2.28	0.11	0.15	60.0	0.54	79.2	-15	83.7	1.10	157
STM141	28192	0.	0.	2550.	0.	149.	254.	F	61.	61.	6.46	0.11	0.14	125.7	1.14	168.2	44	63.9	0.84	140
STM141	28192	0.	0.	2534.	0.	169.	290.	F	61.	69.	6.10	0.11	0.15	128.5	1.16	169.7	41	62.8	0.83	130
STM141	28192	0.	0.	2550.	0.	149.	254.	A	61.	61.	6.21	0.11	0.14	96.0	0.87	128.4	999	60.4	0.80	146
STM141	28192	0.	0.	2584.	0.	169.	290.	A	61.	69.	5.78	0.11	0.15	92.2	0.84	121.8	999	58.6	0.77	137
STM088	28192	0.	2518.	170.	0.	-2369.	2635.		61.	40.	2.12	0.11	0.09	54.0	0.49	74.8	-17	87.5	1.18	152
STM088	28192	0.	51.	2637.	0.	98.	167.	F	61.	40.	5.66	0.11	0.09	120.1	1.09	166.1	47	67.5	0.89	124
STM088	28192	0.	51.	2637.	0.	98	167.	A	61.	40.	5.58	0.11	0.09	8[illegible].0	0.81	123.1	999	64.1	0.85	131
PFBSTM	28192	0.	0.	2567.	0.	[illegible]9.	238.		61.	61.	8.09	0.11	0.13	115.6	1.05	153.8	99	64.7	0.85	142
PFBSTM	28192	0.	0.	2906.	0.	343.	549.		61.	140.	10.37	0.11	0.23	117.2	1.06	137.7	119	58.1	0.77	133
TISTMT	28192	0.	2558.	0.	0.	-2410.	2804.		61.	61.	5.15	0.11	0.13	159.1	1.44	212.2	0	98.1	1.30	145
TISTMT	28192	0.	3124.	0.	0.	-2641.	3926.		61.	197.	9.84	0.11	0.29	354.3	3.21	387.0	0	115.0	1.52	129
TISTMT	28192	0.	0.	2558.	0.	149.	246.		61.	61.	8.99	0.11	0.13	227.1	2.06	303.0	4	77.5	1.02	131
TISTMT	28192	0.	0.	3124.	0.	484.	802.		61.	197.	14.34	0.11	0.29	447.9	4.06	489.2	0	90.8	1.20	118
TIHRSG	28192	0.	2748.	0.	0.	-2599.	2804.		61.	61.	5.88	0.11	0.07	193.4	1.75	240.2	0	107.6	1.42	136
TIHRSG	28192	0.	3296.	0.	0.	-2962.	3423.		61.	136.	9.71	0.11	0.12	359.6	3.26	372.3	0	131.1	1.73	122
TIHRSG	28192	0.	0.	2748.	0.	149.	57.		61.	61.	9.94	0.11	0.07	262.8	2.38	326.4	0	85.6	1.13	123
TIHRSG	28192	0.	0.	3296.	0.	333.	127.		61.	136.	14.58	0.11	0.12	457.0	4.14	473.2	0	106.5	1.41	110
STIRL	28192	2686.	0.	0.	-2686.	149.	2804.		61.	61.	3.62	0.11	0.09	100.1	0.91	127.1	132	111.6	1.47	156
STIRL	28192	3836.	0.	0.	-3836.	599.	4312.		61.	244.	5.71	0.11	0.22	191.9	1.74	170.7	0	130.6	1.73	130
STIRL	28192	0.	2686.	0.	0.	-2538.	2804.		61.	61.	3.62	0.11	0.09	100.1	0.91	127.2	-72	93.7	1.24	150
STIRL	28192	0.	3836.	0.	0.	-3237.	4312.		61.	244.	5.72	0.11	0.22	192.1	1.74	170.9	0	105.0	1.39	122
STIRL	28192	0.	0.	2686.	0.	149.	118.		61.	61.	7.78	0.11	0.09	176.1	1.59	223.7	9	72.5	0.96	129
STIRL	28192	0.	0.	3836.	0.	599.	476.		61.	244.	12.33	0.11	0.22	344.6	3.12	306.5	3	80.1	1.06	103
HEGT60	28192	0.	0.	2972.	0.	149.	-167.	A	61.	61.	8.21	0.11	-0.01	187.0	1.69	214.8	0	79.5	1.05	118
HEGT60	28192	0.	0.	13809.	0.	2571.	-2896.	A	61.	1046.	40.06	0.11	-0.02	1017.5	9.22	251.4	0	201.9	2.67	85
HEGT00	28192	0.	0.	2843.	0.	149.	-39.	A	61.	61.	7.77	0.11	0.04	167.6	1.52	201.2	6	74.8	0.99	125
HEGT00	28192	0.	0.	4244.	0.	537.	-140.	A	61.	219.	10.80	0.11	0.09	234.2	2.12	188.3	2	79.3	1.05	95
FCMCCL	28192	0.	0.	2611.	0.	149.	193.		61.	61.	8.62	0.11	0.12	172.6	1.56	225.5	8	72.6	0.96	133
FCMCCL	28192	0.	0.	4172.	0.	912.	1187.		61.	372.	18.31	0.11	0.33	283.0	2.56	231.5	10	62.[illegible]	0.83	105
FCSTCL	28192	0.	0.	2599.	0.	149.	206.		61.	61.	8.49	0.11	0.12	170.7	1.55	224.1	9	72.1	0.95	134
FCSTCL	28192	0.	0.	4625.	0.	1180.	1634.		61.	481.	20.58	0.11	0.38	318.2	2.88	234.8	11	56.3	0.74	102
IGGTST	28192	0.	0.	2684.	0.	149.	120.		61.	61.	6.91	0.11	0.09	160.6	1.45	204.2	11	70.8	0.94	131
IGGTST	28192	0.	0.	4304.	0.	787.	638.		61.	321.	8.34	0.11	0.25	279.1	2.53	221.3	9	64.3	0.85	98
GTSOAR	28192	0.	2701.	0.	0.	-2552.	2804.		61.	61.	2.98	0.11	0.09	79.2	0.72	100.1	-30	91.3	1.21	155
GTSOAR	28192	0.	5157.	0.	0.	-4082.	5906.		61.	438.	4.78	0.11	0.26	157.5	1.43	104.2	0	103.1	1.36	118
GTAC08	28192	0.	2608.	0.	0.	-2460.	2804.		61.	61.	2.89	0.11	0.12	75.6	0.69	99.0	-24	88.1	1.16	159
GTAC08	28192	0.	3803.	0.	0.	-3065.	4778.		61.	301.	3.50	0.11	0.31	109.6	0.99	98.3	-93	82.5	1.09	133
GTAC12	28192	0.	2615.	0.	0.	-2467.	2804.		61.	61.	2.93	0.11	0.11	77.4	0.70	101.0	-25	88.5	1.17	158
GTAC12	28192	0.	4229.	0.	0.	-3302.	5411.		61.	378.	4.10	0.11	0.33	132.6	1.20	107.0	0	83.6	1.10	127
GTAC16	28192	0.	2631.	0.	0.	-2482.	2804.		61.	61.	2.97	0.11	0.11	79.1	0.72	102.6	-27	89.2	1.18	157

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC16	28192	0.	4667.	0.	0.	-3583.	5934.	61.	442.	4.80	0.11	0.33	159.4	1.44	116.6	0	88.1	1.16	122
GTWC16	28192	0.	2650.	0.	0.	-2502.	2804.	61.	61.	2.94	0.11	0.10	77.8	0.70	100.1	-27	89.6	1.18	157
GTWC16	28192	0.	4835.	0.	0.	-3740.	5971.	61.	446.	4.33	0.11	0.32	140.0	1.27	98.8	0	89.7	1.18	123
CC1626	28192	0.	2661.	0.	0.	-2513.	2804.	61.	61.	3.05	0.11	0.10	77.6	0.70	99.5	-29	90.2	1.19	157
CC1626	28192	0.	5900.	0.	0.	-4334.	7351.	61.	614.	5.31	0.11	0.33	166.5	1.51	96.3	0	93.9	1.24	119
CC1622	28192	0.	2646.	0.	0.	-2496.	2804.	61.	61.	3.06	0.11	0.10	78.5	0.71	101.2	-29	89.9	1.19	157
CC1622	28192	0.	5389.	0.	0.	-4039.	6824.	61.	550.	5.23	0.11	0.34	170.1	1.54	107.7	0	91.1	1.20	120
CC1222	28192	0.	2643.	0.	0.	-2495.	2804.	61.	61.	3.04	0.11	0.10	77.3	0.70	99.8	-28	89.6	1.18	157
CC1222	28192	0.	5336.	0.	0.	-3998.	6787.	61.	546.	5.05	0.11	0.34	157.8	1.43	100.9	0	88.9	1.17	121
CC0822	28192	0.	2620.	0.	0.	-2472.	2804.	61.	61.	3.02	0.11	0.11	76.2	0.69	99.3	-26	88.8	1.17	158
CC0822	28192	0.	4509.	0.	0.	-3465.	5802.	61.	426.	4.27	0.11	0.34	129.4	1.17	97.9	0	83.1	1.10	126
DEHTPM	28192	0.	2685.	0.	0.	-2537.	2804.	61.	61.	4.06	0.11	0.09	115.4	1.05	146.6	0	95.7	1.26	147
DEHTPM	28192	0.	4540.	0.	0.	-3662.	5245.	61.	358.	9.35	0.11	0.26	328.7	2.98	247.1	0	122.6	1.62	114
GTSOAD	28192	2637.	0.	0.	-2637.	149.	2804.	61.	61.	2.87	0.11	0.11	74.9	0.68	96.9	-46	106.5	1.41	164
GTSOAD	28192	4327.	0.	0.	-4327	908.	5347.	61.	370.	3.79	0.11	0.31	119.8	1.09	94.5	0	115.2	1.52	137
GTRA08	28192	2702.	0.	0.	-2702.	149.	2804.	61.	61.	3.09	0.11	0.09	84.3	0.76	106.5	-64	110.0	1.45	139
GTRA08	28192	7248.	0.	0.	-7248.	1860.	8533.	61.	758.	7.19	0.11	0.30	249.4	2.26	117.4	0	165.4	2.18	130
GTRA12	28192	2686.	0.	0.	-2686.	149.	2804.	61.	61.	3.02	0.11	0.09	81.5	0.74	103.6	-57	109.1	1.44	160
GTRA12	28192	6723.	0.	0.	-6723.	1730.	8098.	61.	705.	6.78	0.11	0.32	234.0	2.12	118.8	0	154.2	2.04	129
GTRA16	28192	2679.	0.	0.	-2679.	149.	2804.	61.	61.	3.06	0.11	0.09	82.8	0.75	105.4	-59	109.0	1.44	160
GTRA16	28192	6209.	0.	0.	-6209.	1557.	7521.	61.	635.	6.51	0.11	0.32	224.0	2.03	123.1	0	147.5	1.95	129
GTR208	28192	2673.	0.	0.	-2673.	149.	2804.	61.	61.	2.97	0.11	0.09	79.1	0.72	101.0	-53	108.3	1.43	161
GTR208	28192	5323.	0.	0.	-5323.	1224.	6406.	61.	499.	5.10	0.11	0.30	169.7	1.54	108.8	0	133.7	1.77	130
GTR212	28192	2673.	0.	0.	-2673.	149.	2804.	61.	61.	2.99	0.11	0.09	80.0	0.72	102.2	-54	108.4	1.43	161
GTR212	28192	5546.	0.	0.	-5546.	1316.	6711.	61.	536.	5.39	0.11	0.31	180.7	1.64	111.2	0	136.3	1.80	129
GTR216	28192	2668.	0.	0.	-2668.	149.	2804.	61.	61.	3.02	0.11	0.10	81.4	0.74	104.1	-56	108.4	1.43	161
GTR216	28192	5605.	0.	0.	-5605.	1358.	6852.	61.	554.	5.78	0.11	0.32	195.2	1.78	119.5	0	137.2	1.81	129
GTRW08	28192	2737.	0.	0.	-2737.	149.	2804.	61.	61.	3.08	0.11	0.07	83.5	0.76	104.1	-64	111.2	1.47	158
GTRW08	28192	8554.	0.	0.	-8554.	2158.	9531.	61.	880.	7.06	0.11	0.27	241.9	2.19	96.5	0	169.0	2.50	134
GTRW12	28192	2712.	0.	0.	-2712.	149.	2804.	61.	61.	3.07	0.11	0.08	83.5	0.76	105.0	-62	110.3	1.46	159
GTRW12	28192	8027.	0.	0.	-8027.	2100.	9338.	61.	856.	6.72	0.11	0.30	229.0	2.07	97.3	0	172.6	2.28	133
GTRW16	28192	2703.	0.	0.	-2703.	149.	2804.	61.	61.	3.09	0.11	0.08	84.3	0.76	106.4	-64	110.1	1.45	159
GTRW16	28192	7286.	0.	0.	-7286.	1870.	8566.	61.	762.	6.48	0.11	0.30	220.7	2.00	103.3	0	162.3	2.14	131
GTR308	28192	2757.	0.	0.	-2757.	149.	2804.	61.	61.	2.98	0.11	0.07	78.9	0.71	97.7	-57	111.3	1.47	159
GTR308	28192	7092.	0.	0.	-7092.	1580.	7597.	61.	644.	5.46	0.11	0.23	180.5	1.63	86.8	0	172.1	2.27	130
GTR312	28192	2688.	0.	0.	-2688.	149.	2804.	61.	61.	2.95	0.11	0.09	78.6	0.71	99.8	-53	108.8	1.44	161
GTR312	28192	6233.	0.	0.	-6233.	1532.	7437.	61.	625.	5.23	0.11	0.31	173.0	1.57	94.7	0	143.6	1.90	131
GTR316	28192	2689.	0.	0.	-2689.	149.	2804.	61.	61.	2.98	0.11	0.09	79.6	0.72	101.0	-54	108.9	1.44	161
GTR316	28192	6173.	0.	0.	-6173.	1504.	7343.	61.	613.	5.36	0.11	0.30	178.2	1.61	98.5	0	144.3	1.91	131
FCPADS	28192	2742.	0.	0.	-2742.	149.	2804.	61.	61.	8.84	0.11	0.07	103.0	0.93	128.2	202	119.2	1.57	155
FCPADS	28192	11535.	0.	0.	-11535.	3151.	12855.	61.	1285.	133.06	0.11	0.28	659.3	5.97	195.0	0	391.2	5.17	188
FCMCDS	28192	2671.	0.	0.	-2671.	149.	2804.	61.	61.	8.47	0.11	0.10	105.2	0.95	134.4	999	116.5	1.54	157
FCMCDS	28192	8416.	0.	0.	-8416.	2492.	10651.	61.	1016.	99.62	0.11	0.36	578.8	5.24	234.7	0	286.5	3.78	165

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

ECS	PROCS	FUEL USE IN BTU*10**6 — **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28212	0.	10.	276.	0.	0.	0.	F	4.	0.	1.04	0.07	0.	16.1	1.00	225.5	0	8.3	1.00	80
STM141	28212	0.	260.	0.	0.	-250.	276.		4.	4.	0.80	0.07	0.09	9.7	0.61	128.0	-18	9.7	1.16	159
STM141	28212	0.	286.	0.	0.	-260.	331.		4.	11.	0.65	0.07	0.20	9.8	0.61	117.4	-13	9.1	1.09	148
STM141	28212	0.	0.	260.	0.	10.	17.	F	4.	4.	1.58	0.07	0.09	21.7	1.35	285.0	2	8.5	1.02	135
STM141	28212	0.	0.	286.	0.	26.	44.	F	4.	11.	1.30	0.07	0.20	20.1	1.25	239.6	21	7.2	0.87	124
STM141	28212	0.	0.	260.	0.	10.	17.	A	4.	4.	1.48	0.07	0.09	19.7	1.22	258.4	8	8.2	0.98	136
STM141	28212	0.	0.	286.	0.	26.	44.	A	4.	11.	[illegible]	0.07	0.20	14.9	0.93	177.6	999	6.5	0.78	129
STM088	28212	0.	260.	0.	0.	-250.	276.		4.	4.	0.80	0.07	0.09	9.4	0.59	123.9	-17	9.7	1.16	160
STM088	28212	0.	273.	0.	0.	-255.	304.		4.	7.	0.62	0.07	0.15	8.7	0.54	109.1	-12	9.2	1.10	153
STM088	28212	0.	0.	260.	0.	10.	17.	F	4.	4.	1.57	0.07	0.09	21.4	1.33	280.8	3	8.4	1.01	135
STM088	28212	0.	0.	273.	0.	18.	31.	F	4.	7.	1.23	0.07	0.15	18.5	1.15	231.4	26	7.4	0.89	128
STM088	28212	0.	0.	260.	0.	10.	17.	A	4.	4.	1.48	0.07	0.09	18.9	1.17	248.2	11	8.1	0.97	137
STM088	28212	0.	0.	273.	0.	18.	31.	A	4.	7.	1.12	0.07	0.15	14.0	0.87	175.4	999	6.8	0.81	133
PFBSTM	28212	0.	0.	260.	0.	10.	16.		4.	4.	1.60	0.07	0.09	21.9	1.36	287.1	2	8.5	1.02	135
PFBSTM	28212	0.	0.	320.	0.	45.	74.		4.	18.	1.86	0.07	0.27	24.6	1.53	262.5	12	7.4	0.89	115
TISTMT	28212	0.	260.	0.	0.	-250.	276.		4.	4.	1.03	0.07	0.09	19.7	1.23	258.8	0	11.0	1.32	145
TISTMT	28212	0.	346.	0.	0.	-285.	447.		4.	25.	1.89	0.07	0.32	57.8	3.59	570.2	0	14.6	1.75	121
TISTMT	28212	0.	0.	260.	0.	10.	16.		4.	4.	1.79	0.07	0.09	32.1	2.00	421.9	0	9.8	1.18	130
TISTMT	28212	0.	0.	346.	0.	61.	101.		4.	25.	2.69	0.07	0.32	73.5	4.57	724.4	0	12.7	1.53	112
TIHRSG	28212	0.	269.	0.	0.	-259.	276.		4.	4.	1.11	0.07	0.06	25.6	1.59	324.5	0	11.9	1.43	137
TIHRSG	28212	0.	331.	0.	0.	-297.	356.		4.	14.	1.65	0.07	0.15	53.3	3.31	549.5	0	15.4	1.85	118
TIHRSG	28212	0.	0.	269.	0.	10.	7.		4.	4.	1.92	0.07	0.06	39.2	2.44	497.1	0	10.9	1.31	126
TIHRSG	28212	0.	0.	331.	0.	33.	25.		4.	14.	2.43	0.07	0.15	68.4	4.25	705.6	0	13.8	1.66	110
STIRL	28212	268.	0.	0.	-268.	10.	276.		4.	4.	0.75	0.07	0.06	10.4	0.65	132.9	-35	11.8	1.41	160
STIRL	28212	422.	0.	0.	-422.	72.	485.		4.	29.	0.98	0.07	0.24	22.8	1.42	184.8	0	14.1	1.70	124
STIRL	28212	0.	268.	0.	0.	-258.	276.		4.	4.	0.75	0.07	0.06	10.4	0.65	132.9	-21	9.9	1.19	154
STIRL	28212	0.	422.	0.	0.	-349.	485.		4.	29.	0.98	0.07	0.24	22.9	1.42	185.0	0	11.3	1.35	115
STIRL	28212	0.	0.	268.	0.	10.	9.		4.	4.	1.47	0.07	0.06	21.6	1.34	275.0	3	8.4	1.01	131
STIRL	28212	0.	0.	422.	0.	72.	63.		4.	29.	1.90	0.07	0.24	40.5	2.52	327.7	4	8.7	1.04	96
HEGT60	28212	0.	0.	282.	0.	10.	-5.	A	4.	4.	1.53	0.07	0,02	27.3	1.70	330.5	0	9.4	1.13	123
HEGT60	28212	0.	0.	890.	0.	166.	-92.	A	4.	68.	3.81	0.07	0.08	97.8	6.08	374.8	0	17.8	2.14	87
HEGT00	28212	0.	0.	278.	0.	10.	-1.	A	4.	4.	1.52	0.07	0.03	26.5	1.65	326.2	0	9.3	1.11	125
HEGT00	28212	0.	0.	435.	0.	55.	-7.	A	4.	22.	1.97	0.07	0.10	46.6	2.90	365.6	0	11.1	1.33	88
FCMCCL	28212	0.	0.	263.	0.	10.	13.		4.	4.	1.60	0.07	0.08	27.1	1.68	350.3	0	9.2	1.11	131
FCMCCL	28212	0.	0.	439.	0.	96.	126.		4.	39.	2.90	0.07	0.34	54.4	3.38	423.4	1	9.9	1.19	104
FCSTCL	28212	0.	0.	263.	0.	10.	14.		4.	4.	1.63	0.07	0.08	26.5	1.65	344.7	0	9.2	1.10	131
FCSTCL	28212	0.	0.	511.	0.	138.	193.		4.	56.	3.48	0.07	0.39	64.1	3.98	427.8	3	9.6	1.15	107
IGGTST	28212	0.	0.	268.	0.	10.	9.		4.	4.	1.62	0.07	0.06	26.3	1.64	335.7	0	9.2	1.11	129
IGGTST	28212	0.	0.	476.	0.	94.	83.		4.	38.	1.97	0.07	0.27	50.6	3.15	362.5	2	9.3	1.12	95
GTSOAR	28212	0.	268.	0.	0.	-258.	276.		4.	4.	0.70	0.07	0.06	10.0	0.62	127.9	-19	9.9	1.18	155
GTSOAR	28212	0.	510.	0.	0.	-403.	599.		4.	43.	0.87	0.07	0.28	20.1	1.25	134.4	0	10.8	1.30	118
GTAC08	28212	0.	263.	0.	0.	-254.	276.		4.	4.	0.69	0.07	0 08	9.6	0.59	123.9	-17	9.6	1.16	158
GTAC08	28212	0.	401.	0.	0.	-323.	504.		4.	32.	0.72	0.07	0.31	15.1	0.94	128.3	-34	9.1	1.09	126

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																
		COGENERATION CASE			**NOCOGEN - COGEN**													
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC12	28212	0.	264.	0.	0.	-254.	276.	4.	4.	0.68	0.07	0.08	9.5	0.59	123.1	-17	9.7	1.16	158
GTAC12	28212	0.	447.	0.	0.	-349.	572.	4.	40.	0.80	0.07	0.33	17.8	1.11	136.1	0	9.3	1.12	123
GTAC16	28212	0.	265.	0.	0.	-255.	276.	4.	4.	0.68	0.07	0.08	9.6	0.60	124.4	-17	9.7	1.16	157
GTAC16	28212	0.	486.	0.	0.	-373.	621.	4.	46.	0.87	0.07	0.34	20.5	1.27	144.2	0	9.7	1.16	121
GTWC16	28212	0.	266.	0.	0.	-256.	276.	4.	4.	0.69	0.07	0.07	9.9	0.62	127.2	-18	9.8	1.17	156
GTWC16	28212	0.	511.	0.	0.	-395.	631.	4.	47.	0.87	0.07	0.32	20.1	1.25	134.0	0	10.1	1.22	120
CC1626	28212	0.	267.	0.	0.	-257.	276.	4.	4.	0.76	0.07	0.07	9.8	0.61	125.1	-19	9.9	1.19	156
CC1626	28212	0.	653.	0.	0.	-479.	826.	4.	71.	1.19	0.07	0.35	26.1	1.62	136.6	0	10.9	1.31	120
CC1622	28212	0.	266.	0.	0.	-256.	276.	4.	4.	0.75	0.07	0.07	9.6	0.59	122.8	-18	9.8	1.18	157
CC1622	28212	0.	596.	0.	0.	-440.	767.	4.	64.	1.14	0.07	0.35	25.5	1.59	146.0	0	10.4	1.25	120
CC1222	28212	0.	265.	0.	0.	-256.	276.	4.	4.	0.75	0.07	0.07	9.4	0.58	120.9	-18	9.8	1.17	158
CC1222	28212	0.	591.	0.	0.	-435.	764.	4.	63.	1.12	0.07	0.36	24.2	1.50	139.7	0	10.2	1.22	121
CC0822	28212	0.	264.	0.	0.	-254.	276.	4.	4.	0.76	0.07	0.08	9.6	0.60	124.0	-18	9.8	1.17	158
CC0822	28212	0.	499.	0.	0.	-376.	655.	4.	50.	1.00	0.07	0.36	20.3	1.26	138.8	0	9.4	1.13	123
STIG15	28212	0.	279.	0.	0.	-269.	276.	4.	4.	0.72	0.07	0.03	9.7	0.60	118.9	-21	10.2	1.22	152
STIG15	28212	0.	15923.	0.	0.	-11563.	14842.	4.	1778.	27.14	0.07	0.17	442.5	27.50	94.8	0	214.6	25.77	683
STIG10	28212	0.	276.	0.	0.	-266.	276.	4.	4.	0.70	0.07	0.04	9.5	0.59	117.7	-19	10.0	1.20	154
STIG10	28212	0.	1562.	0.	0.	-1159.	1593.	4.	164.	2.69	0.07	0.22	48.8	3.04	106.7	0	24.3	2.92	132
STIG1S	28212	0.	274.	0.	0.	-264.	276.	4.	4.	0.70	0.07	0.04	9.4	0.59	117.5	-19	10.0	1.20	154
STIG1S	28212	0.	982.	0.	0.	-745.	1036.	4.	96.	1.79	0.07	0.23	29.7	1.84	103.1	0	16.8	2.02	120
DEADV3	28212	0.	272.	0.	0.	-263.	276.	4.	4.	0.78	0.07	0.05	12.3	0.76	153.7	-30	10.3	1.24	149
DEADV3	28212	0.	1142.	0.	0.	-837.	1263.	4.	124.	2.64	0.07	0.27	82.1	5.10	245.3	0	22.8	2.73	128
DEHTPM	28212	0.	266.	0.	0.	-256.	276.	4.	4.	0.82	0.07	0.07	12.7	0.79	162.8	-31	10.2	1.22	151
DEHTPM	28212	0.	484.	0.	0.	-378.	597.	4.	43.	1.42	0.07	0.31	36.7	2.28	259.1	0	12.4	1.49	114
DESOA3	28212	275.	0.	0.	-275.	10.	276.	4.	4.	0.75	0.07	0.04	11.3	0.70	140.8	-43	12.1	1.46	156
DESOA3	28212	1405.	0.	0.	-1405.	365.	1464.	4.	149.	3.66	0.07	0.23	121.1	7.53	294.2	0	40.7	4.89	174
DESOA3	28212	0.	275.	0.	0.	-265.	276.	4.	4.	0.75	0.07	0.04	11.3	0.70	140.8	-26	10.2	1.23	150
DESOA3	28212	0.	1405.	0.	0.	-1041.	1464.	4.	149.	3.66	0.07	0.23	121.1	7.53	294.2	0	31.2	3.74	145
GTSOAD	28212	265.	0.	0.	-265.	10.	276.	4.	4.	0.68	0.07	0.07	9.4	0.58	120.3	-29	11.5	1.38	163
GTSOAD	28212	454.	0.	0.	-454.	95.	562.	4.	39.	0.75	0.07	0.31	15.9	0.99	119.8	999	12.6	1.51	133
GTRA08	28212	268.	0.	0.	-268.	10.	276.	4.	4.	0.69	0.07	0.06	10.2	0.63	129.5	-33	11.7	1.40	160
GTRA08	28212	667.	0.	0.	-667.	171.	816.	4.	70.	1.16	0.07	0.32	30.0	1.87	153.6	0	16.4	1.97	131
GTRA12	28212	267.	0.	0.	-267.	10.	276.	4.	4.	0.69	0.07	0.07	10.1	0.63	129.0	-33	11.6	1.40	161
GTRA12	28212	638.	0.	0.	-638.	164.	793.	4.	67.	1.10	0.07	0.33	28.1	1.75	150.4	0	15.6	1.88	131
GTRA16	28212	267.	0.	0.	-267.	10.	276.	4.	4.	0.70	0.07	0.07	10.3	0.64	131.7	-34	11.7	1.40	160
GTRA16	28212	602.	0.	0.	-602.	151.	749.	4.	62.	1.09	0.07	0.33	28.0	1.74	158.7	0	15.3	1.84	130
GTR208	28212	267.	0.	0.	-267.	10.	276.	4.	4.	0.69	0.07	0.07	9.9	0.62	126.7	-32	11.6	1.39	161
GTR208	28212	533.	0.	0.	-533.	123.	654.	4.	50.	0.91	0.07	0.31	21.6	1.34	138.0	0	14.1	1.70	130
GTR212	28212	267.	0.	0.	-267.	10.	276.	4.	4.	0.69	0.07	0.07	10.0	0.62	128.1	-32	11.6	1.40	161
GTR212	28212	555.	0.	0.	-555.	132.	684.	4.	54.	0.96	0.07	0.32	23.3	1.45	143.3	0	14.4	1.73	130
GTR216	28212	266.	0.	0.	-266.	10.	276.	4.	4.	0.69	0.07	0.07	10.1	0.63	129.3	-33	11.6	1.40	161
GTR216	28212	558.	0.	0.	-558.	135.	696.	4.	55.	1.00	0.07	0.33	24.9	1.55	152.2	0	14.5	1.74	130
GTRW08	28212	271.	0.	0.	-271.	10.	276.	4.	4.	0.70	0.07	0.05	10.2	0.64	129.2	-35	11.8	1.42	159
GTRW08	28212	801.	0.	0.	-801.	202.	920.	4.	82.	1.18	0.07	0.29	29.9	1.86	127.4	0	19.0	2.28	134

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTRW12	28212	269.	0.	0.	-269.	10.	276.	4.	4.	0.70	0.07	0.06	10.2	0.64	129.8	-34	11.7	1.41	160
GTRW12	28212	773.	0.	0.	-773.	202.	920.	4.	82.	1.17	0.07	0.31	29.8	1.85	131.7	0	17.9	2.15	134
GTRW16	28212	269.	0.	0.	-269.	10.	276.	4.	4.	0.70	0.07	0.06	10.4	0.65	132.1	-35	11.7	1.41	159
GTRW16	28212	719.	0.	0.	-719.	185.	861.	4.	75.	1.15	0.07	0.31	29.3	1.82	138.8	0	17.2	2.07	132
GTR308	28212	272.	0.	0.	-272.	10.	276.	4.	4.	0.69	0.07	0.05	9.9	0.62	124.8	-34	11.8	1.42	160
GTR308	28212	687.	0.	0.	-687.	153.	756.	4.	62.	1.02	0.07	0.24	24.3	1.51	121.0	0	17.8	2.14	129
GTR312	28212	268.	0.	0.	-268.	10.	276.	4.	4.	0.69	0.07	0.06	10.0	0.62	127.8	-33	11.7	1.40	161
GTR312	28212	639.	0.	0.	-639.	157.	769.	4.	64.	1.01	0.07	0.31	24.4	1.51	130.2	0	15.7	1.89	131
GTR316	28212	268.	0.	0.	-268.	10.	276.	4.	4.	0.70	0.07	0.06	10.2	0.64	130.0	-34	11.7	1.41	160
GTR316	28212	634.	0.	0.	-634.	154.	760.	4.	63.	1.03	0.07	0.31	25.2	1.56	135.4	0	15.8	1.90	131
FCPADS	28212	272.	0.	0.	-272.	10.	276.	4.	4.	1.00	0.07	0.05	10.5	0.65	131.8	-39	12.2	1.46	159
FCPADS	28212	1218.	0.	0.	-1218.	333.	1357.	4.	136.	14.73	0.07	0.28	79.4	4.93	222.5	0	43.0	5.16	190
FCMCDS	28212	268.	0.	0.	-268.	10.	276.	4.	4.	0.97	0.07	0.07	10.7	0.66	136.3	-38	12.0	1.44	160
FCMCDS	28212	888.	0.	0.	-888.	263.	1124.	4.	107.	11.05	0.07	0.36	68.2	4.24	261.8	0	31.3	3.76	167

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		-----------FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28213	0.	154.	452.	0.	0.	0.		55.	0.	0.16	11.73	0.	1.2	1.00	219.6	0	17.6	1.00	80
STM141	28213	0.	154.	447.	0.	-1.	4.		55.	[illegible]	0.23	11.73	0.01	1.9	1.53	304.1	0	17.6	1.00	77
STM141	28213	0.	134.	468.	0.	20.	-17.	F	55.	1.	0.37	11.73	0.01	3.2	2.68	530.4	1	17.6	1.00	66
STM141	28213	0.	134.	468.	0.	20.	-17.	A	55.	1.	0.32	11.73	0.01	3.0	2.50	495.0	4	17.6	1.00	67
STM088	28213	0.	154.	449.	0.	-0.	2.		55.	0.	0.22	11.73	0.00	1.6	1.28	268.1	0	17.6	1.00	79
STM088	28213	0.	134.	469.	0.	19.	-18.	F	55.	0.	0.36	11.73	0.00	2.9	2.43	503.8	0	17.6	1.01	66
STM088	28213	0.	134.	469.	0.	19.	-18.	A	55.	0.	0.32	11.73	0.00	2.8	2.34	484.6	3	17.6	1.00	67
PFBSTM	28213	0.	132.	466.	0.	21.	-15.		55.	1.	0.40	11.73	0.01	4.6	3.78	664.5	1	17.7	1.01	65
TISTMT	28213	0.	156.	439.	0.	-3.	13.		55.	2.	0.41	11.73	0.02	8.4	6.90	1130.4	0	18.3	1.04	62
TISTMT	28213	0.	131.	464.	0.	23.	-13.		55.	2.	0.57	11.73	0.02	10.7	8.82	1445.6	0	18.4	1.05	60
TIHRSG	28213	0.	158.	443.	0.	-5.	9.		55.	1.	0.33	11.73	0.01	8.2	6.75	1073.4	0	18.3	1.04	59
TIHRSG	28213	0.	132.	469.	0.	21.	-17.		55.	1.	0.49	11.73	0.01	10.6	8.72	1386.0	0	18.5	1.05	58
STIRL	28213	32.	130.	434.	-32.	24.	18.		55.	2.	0.21	11.73	0.02	2.0	1.66	213.2	0	17.6	1.00	83
STIRL	28213	0.	162.	434.	0.	-8.	18.		55.	2.	0.21	11.73	0.02	2.0	1.66	213.5	16	17.4	0.99	83
STIRL	28213	0.	130.	466.	0.	24.	-14.		55.	2.	0.36	11.73	0.02	3.9	3.21	413.3	10	17.4	0.99	71
HEGT60	28213	0.	120.	481.	0.	34.	-30.	A	55.	6.	0.73	11.73	0.01	17.8	14.69	767.0	0	18.9	1.07	67
HEGT00	28213	0.	131.	471.	0.	23.	-20.	A	55.	2.	0.38	11.73	0.01	7.7	6.38	775.3	0	18.0	1.02	62
FCMCCL	28213	0.	127.	461.	0.	26.	-9.		55.	3.	0.49	11.73	0.03	8.9	7.35	895.0	1	17.8	1.02	66
FCSTCL	28213	0.	125.	457.	0.	28.	-6.		55.	4.	0.60	11.73	0.04	9.9	8.19	906.2	1	17.9	1.02	68
IGGTST	28213	0.	129.	465.	0.	25.	-14.		55.	3.	0.54	11.73	0.02	8.8	7.30	868.7	0	18.1	1.03	64
GTSOAR	28213	0.	167.	423.	0.	-13.	28.		55.	3.	0.23	11.73	0.02	3.3	2.72	278.7	10	17.4	0.99	78
GTAC08	28213	0.	160.	431.	0.	-6.	20.		55.	2.	0.19	11.73	0.02	2.4	1.97	262.1	18	17.3	0.99	81
GTAC12	28213	0.	162.	426.	0.	-8.	25.		55.	3.	0.21	11.73	0.03	2.6	2.18	260.4	17	17.3	0.98	81
GTAC16	28213	0.	164.	422.	0.	-10.	29.		55.	4.	0.22	11.73	0.03	3.0	2.45	268.8	16	17.3	0.98	80
GTUC16	28213	0.	165.	422.	0.	-12.	30.		55.	4.	0.23	11.73	0.03	3.3	2.71	283.9	12	17.3	0.99	79
CC1626	28213	0.	170.	411.	0.	-17.	40.		55.	5.	0.34	11.73	0.04	4.0	3.26	283.2	10	17.4	0.99	79
CC1622	28213	0.	168.	415.	0.	-14.	36.		55.	4.	0.32	11.73	0.04	3.5	2.88	273.3	11	17.3	0.99	80
CC1222	28213	0.	167.	416.	0.	-14.	36.		55.	4.	0.31	11.73	0.04	3.3	2.71	260.5	12	17.3	0.99	81
CC0822	28213	0.	163.	424.	0.	-9.	28.		55.	3.	0.29	11.73	0.03	3.0	2.49	283.2	12	17.4	0.99	80
DEADV3	28213	0.	204.	368.	0.	-50.	84.		55.	10.	0.45	11.73	0.06	8.4	6.91	304.0	4	17.7	1.01	81
DEHTPM	28213	0.	164.	425.	0.	-11.	26.		55.	3.	0.32	11.73	0.03	4.8	4.00	443.2	2	17.7	1.01	72
DESOA3	28213	117.	104.	350.	-117.	49.	102.		55.	12.	0.53	11.73	0.06	10.9	8.98	316.3	0	18.8	1.07	82
DESOA3	28213	0.	222.	350.	0.	-68.	102.		55.	12.	0.53	11.73	0.06	10.9	8.98	316.3	0	18.0	1.03	81
GTSOAD	28213	35.	127.	427.	-35.	26.	25.		55.	3.	0.20	11.73	0.03	2.5	2.04	240.0	7	17.5	1.00	82
GTRA08	28213	54.	121.	405.	-54.	33.	46.		55.	6.	0.28	11.73	0.04	4.6	3.78	289.8	2	17.7	1.01	79
GTRA12	28213	51.	122.	408.	-31.	32.	44.		55.	5.	0.27	11.73	0.04	4.3	3.59	290.5	3	17.6	1.00	79
GTRA16	28213	48.	123.	411.	-48.	31.	40.		55.	5.	0.27	11.73	0.04	4.3	3.59	309.6	2	17.6	1.01	78
GTR208	28213	42.	125.	419.	-42.	28.	32.		55.	4.	0.24	11.73	0.03	3.4	2.81	277.0	3	17.6	1.00	79
GTR212	28213	44.	125.	417.	-44.	29.	35.		55.	4.	0.24	11.73	0.03	3.7	3.03	286.7	3	17.6	1.00	79
GTR216	28213	44.	124.	416.	-44.	29.	36.		55.	4.	0.25	11.73	0.03	3.8	3.15	296.0	3	17.6	1.00	79
GTRW08	28213	64.	119.	397.	-64.	35.	54.		55.	7.	0.30	11.73	0.04	5.1	4.21	270.6	0	17.8	1.02	80
GTRW12	28213	62.	119.	398.	-62.	35.	54.		55.	7.	0.30	11.73	0.05	5.1	4.19	281.1	0	17.7	1.01	80
GTRW16	28213	57.	120.	403.	-57.	33.	49.		55.	6.	0.29	11.73	0.04	5.0	4.12	299.5	0	17.7	1.01	79

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTR308	28213	55.	123.	411.	-55.	31.	41.	55.	5.	0.26	11.73	0.03	4.0	3.28	247.7	0	17.8	1.02	79
GTR312	28213	50.	123.	410.	-50.	31.	41.	55.	5.	0.26	11.73	0.04	4.1	3.36	278.7	2	17.7	1.01	79
GTR316	28213	49.	123.	411.	-49.	31.	40.	55.	5.	0.26	11.73	0.04	4.2	3.50	292.3	0	17.7	1.01	79
FCPADS	28213	94.	109.	365.	-94.	45.	86.	55.	10.	1.20	11.73	0.06	7.0	5.80	254.7	0	18.8	1.07	85
FCMCDS	28213	69.	115.	383.	-69.	39.	68.	55.	8.	0.91	11.73	0.06	5.9	4.90	295.1	0	18.2	1.03	83

SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

ECS	PROCS	FUEL USE IN BTU*10**6 — **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28221	0.	18.	103.	0.	0.	0.	A	8.	0.	0.43	0.73	0.	4.2	1.00	350.2	0	3.9	1.00	80
STM141	28221	0.	63.	44.	0.	-45.	59.		8.	2.	0.32	0.73	0.12	3.4	0.81	235.5	999	3.8	0.98	130
STM141	28221	0.	13.	94.	0.	5.	9.	F	8.	2.	0.54	0.73	0.12	6.1	1.45	421.6	11	3.7	0.95	115
STM141	28221	0.	13.	94.	0.	5.	9.	A	8.	2.	0.48	0.73	0.12	5.3	1.26	363.8	23	3.5	0.91	117
STM088	28221	0.	62.	49.	0.	-44.	54.		8.	2.	0.31	0.73	0.09	2.9	0.70	212.0	-1	3.8	0.99	126
STM088	28221	0.	15.	96.	0.	4.	7.	F	8.	2.	0.52	0.73	0.09	5.6	1.33	403.5	11	3.7	0.97	110
STM088	28221	0.	15.	96.	0.	4.	7.	A	8.	2.	0.46	0.73	0.09	5.0	1.18	357.3	24	3.6	0.93	112
PFBSTM	28221	0.	10.	89.	0.	8.	14.		8.	3.	0.63	0.73	0.19	8.1	1.91	496.8	9	3.7	0.95	122
TISTMT	28221	0.	67.	24.	0.	-49.	79.		8.	5.	0.66	0.73	0.25	16.0	3.80	909.0	0	5.0	1.30	130
TISTMT	28221	0.	7.	84.	0.	11.	19.		8.	5.	0.92	0.73	0.25	20.4	4.83	1158.0	0	5.0	1.30	127
TIHRSG	28221	0.	66.	43.	0.	-48.	59.		8.	2.	0.51	0.73	0.09	13.8	3.28	883.7	0	5.1	1.33	106
TIHRSG	28221	0.	13.	97.	0.	5.	6.		8.	2.	0.75	0.73	0.09	17.9	4.23	1140.8	0	5.2	1.35	103
STIRL	28221	74.	5.	15.	-74.	14.	87.		8.	6.	0.33	0.73	0.22	4.4	1.05	203.2	0	4.0	1.04	146
STIRL	28221	0.	79.	15.	0.	-61.	87.		8.	6.	0.33	0.73	0.22	4.4	1.05	203.4	161	3.5	0.91	143
STIRL	28221	0.	5.	90.	0.	14.	13.		8.	6.	0.57	0.73	0.22	7.6	1.80	349.9	17	3.2	0.83	128
HEGT85	28221	0.	0.	106.	0.	18.	-3.	A	8.	8.	1.14	0.73	0.13	24.2	5.74	780.8	0	5.5	1.44	126
HEGT85	28221	0.	0.	219.	0.	51.	-9.	A	8.	21.	1.57	0.73	0.16	42.6	10.07	662.0	0	7.4	1.93	116
HEGT60	28221	0.	0.	103.	0.	18.	-0.	A	8.	8.	1.00	0.73	0.15	21.9	5.18	723.3	0	5.1	1.32	127
HEGT60	28221	0.	0.	111.	0.	21.	-1.	A	8.	8.	0.90	0.73	0.15	22.5	5.33	694.0	0	5.0	1.30	116
HEGT00	28221	0.	9.	102.	0.	9.	0.	A	8.	4.	0.59	0.73	0.08	12.9	3.06	624.1	0	4.3	1.13	106
FCMCCL	28221	0.	2.	81.	0.	16.	21.		8.	7.	0.80	0.73	0.31	15.3	3.63	708.3	4	4.0	1.04	134
FCSTCL	28221	0.	0.	77.	0.	18.	26.		8.	8.	1.08	0.73	0.37	17.2	4.06	761.9	2	4.3	1.11	152
FCSTCL	28221	0.	0.	89.	0.	25.	35.		8.	10.	1.02	0.73	0.40	18.5	4.39	712.1	3	4.1	1.06	142
IGGTST	28221	0.	1.	87.	0.	17.	16.		8.	7.	0.81	0.73	0.27	15.9	3.76	655.0	3	4.1	1.07	129
GTSOAR	28221	0.	82.	5.	0.	-64.	98.		8.	7.	0.32	0.73	0.28	5.4	1.27	226.1	29	3.4	0.88	145
GTAC08	28221	0.	73.	17.	0.	-55.	85.		8.	5.	0.28	0.73	0.25	4.1	0.97	204.9	999	3.3	0.86	147
GTAC12	28221	0.	77.	6.	0.	-59.	96.		8.	7.	0.30	0.73	0.31	4.6	1.09	208.8	122	3.2	0.83	152
GTAC16	28221	0.	80.	0.	0.	-61.	103.		8.	8.	0.36	0.73	0.34	5.2	1.24	223.9	42	3.2	0.83	163
GTAC16	28221	0.	80.	0.	0.	-62.	104.		8.	8.	0.32	0.73	0.34	5.2	1.22	219.5	48	3.2	0.82	153
GTWC16	28221	0.	84.	0.	0.	-65.	103.		8.	8.	0.40	0.73	0.31	5.7	1.35	231.7	24	3.4	0.89	159
GTWC16	28221	0.	87.	0.	0.	-67.	107.		8.	8	0.33	0.73	0.32	5.6	1.33	221.4	28	3.3	0.86	148
CC1626	28221	0.	84.	0.	0.	-66.	103.		8.	8.	0.55	0.73	0.31	6.3	1.50	257.3	11	3.7	0.95	157
CC1526	28221	0.	114.	0.	0.	-83.	145.		8.	13.	0.50	0.73	0.35	7.6	1.80	228.2	9	3.6	0.95	146
CC1622	28221	0.	82.	0.	0.	-64.	103.		8.	8.	0.53	0.73	0.32	6.0	1.42	249.2	15	3.6	0.92	160
CC1622	28221	0.	104.	0.	0.	-76.	134.		8.	11.	0.47	0.73	0.36	6.9	1.62	226.2	14	3.5	0.90	149
CC1222	28221	0.	82.	0.	0.	-64.	103.		8.	8.	0.53	0.73	0.32	5.8	1.37	240.8	18	3.5	0.91	161
CC1222	28221	0.	103.	0.	0.	-75.	134.		8.	11.	0.46	0.73	0.37	6.5	1.55	217.3	18	3.4	0.89	150
CC0822	28221	0.	79.	0.	0.	-61.	103.		8.	8.	0.51	0.73	0.35	5.8	1.36	247.8	21	3.4	0.88	163
CC0822	28221	0.	87.	0.	0.	-65.	115.		8.	9.	0.43	0.73	0.37	5.9	1.39	230.2	24	3.3	0.85	153
STIG15	28221	0.	107.	0.	0.	-89.	103.		8.	8.	0.57	0.73	0.11	6.7	1.58	212.5	0	4.4	1.13	137
STIG15	28221	0.	2692.	0.	0.	-1955.	2509.		8.	301.	5.31	0.73	0.17	90.2	21.34	114.3	0	38.7	10.06	290
STIG10	28221	0.	101.	0.	0.	-83.	103.		8.	8.	0.53	0.73	0.16	6.2	1.47	208.8	0	4.1	1.06	143
STIG10	28221	0.	264.	0.	0.	-196.	269.		8.	28.	0.73	0.73	0.22	11.7	2.77	151.3	0	5.9	1.52	119

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
STIGIS	28221	0.	99.	0.	0.	-80.	103.	8.	8.	0.52	0.73	0.19	5.9	1.41	205.8	0	4.0	1.03	146
STIGIS	28221	0.	166.	0.	0.	-126.	175.	8.	16.	0.54	0.73	0.23	8.0	1.90	165.2	0	4.6	1.18	131
DEADV3	28221	0.	93.	0.	0.	-74.	103.	8.	8.	0.57	0.73	0.24	8.4	1.98	308.3	0	4.1	1.07	146
DEADV3	28221	0.	161.	0.	0.	-118.	185.	8.	18.	0.60	0.73	0.29	12.4	2.94	262.5	0	4.7	1.23	131
DEHTPM	28221	0.	79.	0.	0.	-60.	103.	8.	8.	0.53	0.73	0.35	7.8	1.85	339.1	10	3.6	0.94	158
DEHTPM	28221	0.	81.	0.	0.	-62.	107.	8.	8.	0.46	0.73	0.36	7.8	1.85	327.1	11	3.5	0.92	148
DESOA3	28221	97.	0.	0.	-97.	18.	103.	8.	8.	0.57	0.73	0.20	8.3	1.96	292.0	0	4.9	1.26	147
DESOA3	28221	191.	0.	0.	-191.	50.	207.	8.	20.	0.75	0.73	0.26	17.4	4.13	310.8	0	7.0	1.82	133
DESOA3	28221	0.	97.	0.	0.	-78.	103.	8.	8.	0.57	0.73	0.20	8.3	1.96	292.0	0	4.2	1.10	142
DESOA3	28221	0.	191.	0.	0.	-142.	207.	8.	20.	0.75	0.73	0.26	17.4	4.13	310.8	0	5.8	1.50	125
GTSOAD	28221	75.	3.	9.	-75.	16.	94.	8.	6.	0.29	0.73	0.29	4.2	1.00	190.9	999	3.7	0.96	154
GTRA08	28221	84.	0.	0.	-84.	18.	103.	8.	8.	0.46	0.73	0.31	6.5	1.53	264.7	0	4.1	1.06	160
GTRA08	28221	101.	0.	0.	-101.	26.	128.	8.	11.	0.38	0.73	0.34	7.1	1.69	241.9	0	4.1	1.07	151
GTRA12	28221	83.	0.	0.	-83.	18.	103.	8.	8.	0.45	0.73	0.32	6.4	1.52	264.7	0	4.0	1.05	161
GTRA12	28221	98.	0.	0.	-98.	25.	126.	8.	10.	0.38	0.73	0.35	7.0	1.66	244.0	0	4.1	1.06	151
GTRA16	28221	83.	0.	0.	-83.	18.	103.	8.	8.	0.45	0.73	0.32	6.7	1.58	275.5	0	4.1	1.06	161
GTRA16	28221	94.	0.	0.	-94.	24.	120.	8.	10.	0.38	0.73	0.35	7.1	1.68	257.3	0	4.1	1.06	151
GTR208	28221	83.	0.	0.	-83.	18.	103.	8.	8.	0.40	0.73	0.32	5.7	1.35	235.8	0	3.9	1.02	163
GTR208	28221	86.	0.	0.	-86.	20.	107.	8.	8.	0.33	0.73	0.32	5.7	1.34	225.2	5	3.9	1.00	153
GTR212	28221	83.	0.	0.	-83.	18.	103.	8.	8.	0.43	0.73	0.32	6.0	1.43	248.4	0	4.0	1.03	162
GTR212	28221	89.	0.	0.	-89.	21.	112.	8.	9.	0.35	0.73	0.33	6.1	1.44	233.5	0	3.9	1.02	152
GTR216	28221	82.	0.	0.	-82.	18.	103.	8.	8.	0.43	0.73	0.32	6.2	1.47	258.8	0	4.0	1.03	162
GTR216	28221	89.	0.	0.	-89.	22.	114.	8.	9.	0.36	0.73	0.34	6.4	1.51	243.4	0	3.9	1.02	152
GTRW08	28221	90.	0.	0.	-90.	18.	103.	8.	8.	0.48	0.73	0.26	6.7	1.58	264.9	0	4.3	1.13	155
GTRW08	28221	122.	0.	0.	-122.	31.	145.	8.	13.	0.42	0.73	0.30	8.0	1.90	223.2	0	4.7	1.21	145
GTRW12	28221	87.	0.	0.	-87.	18.	103.	8.	8.	0.48	0.73	0.28	6.7	1.58	261.0	0	4.3	1.11	157
GTRW12	28221	120.	0.	0.	-120.	32.	147.	8.	13.	0.42	0.73	0.32	8.1	1.92	229.2	0	4.5	1.18	146
GTRW16	28221	87.	0.	0.	-87.	18.	103.	8.	8.	0.48	0.73	0.28	6.9	1.63	270.0	0	4.3	1.11	157
GTRW16	28221	114.	0.	0.	-114.	29.	139.	8.	12.	0.42	0.73	0.32	8.1	1.91	241.0	0	4.5	1.16	147
GTR308	28221	92.	0.	0.	-92.	18.	103.	8.	8.	0.45	0.73	0.24	6.1	1.44	225.9	0	4.3	1.12	155
GTR308	28221	106.	0.	0.	-106.	24.	120.	8.	10.	0.37	0.73	0.26	6.4	1.51	205.3	0	4.4	1.14	145
GTR312	28221	86.	0.	0.	-86.	18.	103.	8.	8.	0.45	0.73	0.29	6.2	1.47	245.6	0	4.2	1.06	159
GTR312	28221	104.	0.	0.	-104.	26.	127.	8.	10.	0.38	0.73	0.32	6.8	1.60	221.0	0	4.2	1.10	149
GTR316	28221	87.	0.	0.	-87.	18.	103.	8.	8.	0.46	0.73	0.28	6.5	1.53	255.0	0	4.2	1.09	158
GTR316	28221	104.	0.	0.	-104.	25.	126.	8.	10.	0.38	0.73	0.31	7.0	1.66	231.2	0	4.3	1.11	148
FCPADS	28221	95.	0.	0.	-95.	18.	103.	8.	8.	1.06	0.73	0.22	6.7	1.58	239.7	0	5.1	1.33	154
FCPADS	28221	206.	0.	0.	-206.	56.	229.	8.	23.	2.51	0.73	0.28	14.5	3.44	240.6	0	8.5	2.20	145
FCMCDS	28221	86.	0.	0.	-86.	18.	103.	8.	8.	1.01	0.73	0.29	6.9	1.64	274.1	0	4.8	1.24	161
FCMCDS	28221	150.	0.	0.	-150.	44.	190.	8.	18.	1.90	0.73	0.36	12.4	2.92	280.7	0	6.6	1.70	150

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28241	0.	114.	263.	0.	0.	0.		32.	0.	0.21	3.64	0.	1.8	1.00	174.4	0	11.1	1.00	80
STM141	28241	0.	116.	252.	0.	-2.	10.		32.	1.	0.30	3.64	0.02	2.9	1.59	242.5	7	11.1	1.00	85
STM141	28241	0.	75.	293.	0.	38.	-30.	F	32.	1.	0.49	3.64	0.02	5.2	2.87	437.7	6	11.1	0.99	74
STM141	28241	0.	75.	293.	0.	38.	-30.	A	32.	1.	0.43	3.64	0.02	4.5	2.52	383.4	10	10.9	0.98	75
STM088	28241	0.	115.	256.	0.	-1.	7.		32.	1.	0.28	3.64	0.01	2.4	1.35	215.7	5	11.1	1.00	85
STM088	28241	0.	76.	295.	0.	37.	-32.	F	32.	1.	0.47	3.64	0.01	4.7	2.61	417.4	6	11.1	1.00	72
STM088	28241	0.	76.	295.	0.	37.	-32.	A	32.	1.	0.42	3.64	0.01	4.2	2.35	375.7	9	11.0	0.99	73
PFBSTM	28241	0.	73.	289.	0.	41.	-26.		32.	2.	0.56	3.64	0.04	7.0	3.86	524.4	6	11.1	0.99	76
TISTMT	28241	0.	119.	236.	0.	-6.	27.		32.	3.	0.58	3.64	0.06	13.6	7.56	951.2	0	12.2	1.09	77
TISTMT	28241	0.	70.	285.	0.	43.	-22.		32.	3.	0.82	3.64	0.06	17.4	9.64	1214.7	0	12.2	1.10	75
TIHRSG	28241	0.	121.	247.	0.	-7.	16.		32.	2.	0.47	3.64	0.02	12.7	7.04	912.1	0	12.3	1.11	69
TIHRSG	28241	0.	74.	294.	0.	40.	-31.		32.	2.	0.70	3.64	0.02	16.4	9.06	1177.6	0	12.4	1.11	67
STIRL	28241	62.	68.	227.	-62.	46.	36.		32.	4.	0.30	3.64	0.05	3.7	2.06	204.6	0	11.3	1.01	93
STIRL	28241	0.	129.	227.	0.	-16.	36.		32.	4.	0.30	3.64	0.05	3.7	2.06	204.6	14	10.9	0.97	92
STIRL	28241	0.	68.	288.	0.	46.	-26.		32.	4.	0.51	3.64	0.05	6.5	3.62	361.8	12	10.6	0.95	83
HEGT60	28241	0.	56.	308.	0.	58.	-45.	A	32.	9.	0.95	3.64	0.03	23.8	13.21	677.8	0	12.5	1.12	81
HEGT00	28241	0.	71.	299.	0.	43.	-36.	A	32.	3.	0.55	3.64	0.02	11.9	6.58	647.0	0	11.6	1.04	72
FCMCCL	28241	0.	65.	280.	0.	49.	-17.		32.	6.	0.73	3.64	0.09	13.8	7.64	740.9	4	11.3	1.02	83
FCSTCL	28241	0.	60.	272.	0.	54.	-9.		32.	8.	0.89	3.64	0.12	15.9	8.79	748.7	4	11.2	1.01	90
IGGTST	28241	0.	66.	287.	0.	48.	-25.		32.	5.	0.73	3.64	0.06	13.7	7.60	695.1	2	11.5	1.03	80
GTSOAR	28241	0.	136.	212.	0.	-22.	51.		32.	6.	0.31	3.64	0.08	5.0	2.79	235.4	12	10.8	0.97	93
GTAC08	28241	0.	125.	225.	0.	-12.	38.		32.	5.	0.26	3.64	0.07	3.8	2.08	220.1	20	10.7	0.96	94
GTAC12	28241	0.	129.	215.	0.	-15.	48.		32.	6.	0.28	3.64	0.09	4.2	2.33	221.8	20	10.6	0.95	96
GTAC16	28241	0.	132.	208.	0.	-19.	54.		32.	7.	0.30	3.64	0.10	4.7	2.63	231.1	18	10.5	0.94	97
GTWC16	28241	0.	136.	207.	0.	-22.	56.		32.	7.	0.3'	3.64	0.09	5.1	2.84	236.3	15	10.6	0.95	95
CC1626	28241	0.	147.	182.	0.	-33.	80.		32.	10.	[illegible]	3.64	0.13	6.4	3.54	236.5	13	10.5	0.95	100
CC1622	28241	0.	141.	191.	0.	-27.	72.		32.	9.	0..2	3.64	0.12	5.7	3.18	232.7	15	10.5	0.94	100
CC1222	28241	0.	141.	191.	0.	-27.	72.		32.	9.	0.42	3.64	0.12	5.4	3.02	222.9	16	10.5	0.94	100
CC0822	28241	0.	132.	207.	0.	-18.	56.		32.	7.	0.39	3.64	0.10	4.9	2.71	237.0	16	10.6	0.95	97
STIG15	28241	0.	317.	0.	0.	-204.	263.		32.	32.	1.08	3.64	0.16	14.8	8.22	159.4	0	11.8	1.06	118
STIG15	28241	0.	2308.	0.	0.	-1640.	2116.		32.	258.	4.60	3.64	0.17	76.8	42.56	113.5	0	37.8	3.40	126
STIG10	28241	0.	246.	67.	0.	-133.	196.		32.	24.	0 66	3.64	0.17	10.5	5.80	157.8	8	10.8	0.97	106
STIG1S	28241	0.	187.	148.	0.	-73	115.		32.	14.	0.49	3.64	0.11	7.2	3.99	172.7	9	10.8	0.97	101
DEADV3	28241	0.	495.	120.	0.	-82.	142.		32.	17.	0.60	3.64	0.16	12.3	6.81	262.6	6	10.9	0.98	104
DEHTPM	28241	0.	133.	210.	0.	-19.	52.		32.	6.	0.43	3.64	0.09	7.2	3.97	348.6	7	11.0	0.99	91
DESOA3	28241	195.	28.	94.	-195.	86.	169.		32.	21.	0.76	3.64	0.16	17.7	9.82	310.6	0	13.0	1.16	107
DESOA3	28241	0.	223.	94.	0.	-109.	169.		32.	21.	0.76	3.64	0.16	17.7	9.82	310.6	1	11.7	1.05	105
GTSOAD	28241	66.	65.	217.	-66.	49.	46.		32.	6.	0.27	3.64	0.08	3.9	2.16	202.9	9	11.0	0.99	97
GTRA08	28241	94.	54.	182.	-94.	59.	81.		32.	10.	0.37	3.64	0.12	6.8	3.77	246.5	5	11.1	1.00	100
GTRA12	28241	91.	55.	185.	-91.	59.	78.		32.	10.	0.36	3.64	0.12	6.7	3.69	250.6	6	11.1	1.00	100
GTRA16	28241	86.	57.	191.	-86.	57.	72.		32.	9.	0.36	3.64	0.11	6.7	3.71	265.6	5	11.2	1.00	98
GTR208	28241	77.	61.	204.	-77.	53.	59.		32.	7.	0.32	3.64	0.09	5.3	2.92	234.9	5	11.1	1.00	97
GTR212	28241	80.	60.	200.	-80.	54.	63.		32.	8.	0.33	3.64	0.10	5.7	3.14	243.3	5	11.1	1.00	97

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTR216	28241	80.	59.	198.	-80.	55.	65.	32.	8.	0.34	3.64	0.11	5.9	3.29	252.9	5	11.1	1.00	98
GTRW08	28241	114.	50.	167.	-114.	64.	96.	32.	12.	0.41	3.64	0.12	7.6	4.23	229.2	0	11.4	1.02	101
GTRW12	28241	110.	50.	166.	-110.	64.	96.	32.	12.	0.40	3.64	0.13	7.6	4.23	236.7	3	11.2	1.01	103
GTRW16	28241	103.	52.	174.	-103.	62.	83.	32.	11.	0.40	3.64	0.13	7.6	4.19	250.5	3	11.3	1.01	101
GTR308	28241	98.	57.	190.	-98.	57.	73.	32.	9.	0.35	3.64	0.09	6.1	3.36	211.5	0	11.5	1.03	97
GTR312	28241	92.	56.	187.	-92.	58.	76.	32.	9.	0.36	3.64	0.11	6.3	3.47	232.1	4	11.2	1.00	99
GTR316	28241	91.	56.	188.	-91.	58.	74.	32.	9.	0.36	3.64	0.11	6.5	3.60	242.9	3	11.2	1.01	99
FCPADS	28241	176.	30.	101.	-176.	83.	161.	32.	20.	2.16	3.64	0.18	12.4	6.85	239.1	0	13.4	1.21	113
FCMCDS	28241	129.	40.	135.	-129.	73.	128.	32.	16.	1.64	3.64	0.19	10.7	5.96	284.6	0	12.3	1.10	111

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28242	0.	54.	90.	0.	0.	0.		11.	0.	0.19	1.63	0.	1.5	1.00	192.2	C	4.9	1.00	80
STM141	28242	0.	57.	75.	0.	-3.	15.		11.	2.	0.29	1.63	0.09	2.9	1.88	283.3	12	4.8	0.97	100
STM141	28242	0.	22.	110.	0.	32.	-19.	F	11.	2.	0.47	1.63	0.09	4.9	3.22	485.7	9	4.7	0.96	91
STM141	28242	0.	22.	110.	0.	32.	-19.	A	11.	2.	0.41	1.63	0.09	4.4	2.88	434.8	12	4.6	0.94	92
STM088	28242	0.	56.	79.	0.	-2.	12.		11.	1.	0.27	1.63	0.07	2.4	1.61	254.6	12	4.8	0.98	99
STM088	28242	0.	23.	111.	0.	31.	-21.	F	11.	1.	0.45	1.63	0.07	4.5	2.93	464.6	8	4.8	0.97	87
STM088	28242	0.	23.	111.	0.	31.	-21.	A	11.	1.	0.40	1.63	0.07	4.1	2.70	427.1	11	4.7	0.95	88
PFESTM	28242	0.	20.	106.	0.	34.	-16.		11.	3.	0.53	1.63	0.13	6.5	4.28	581.5	8	4.7	0.96	96
TISTMT	28242	0.	60.	61.	0.	-6.	29.		11.	4.	0.54	1.63	0.16	12.4	8.13	1013.8	0	5.7	1.16	103
TISTMT	28242	0.	18.	103.	0.	36.	-12.		11.	4.	0.76	1.63	0.16	15.8	10.34	1288.8	0	5.7	1.17	101
TIHRSG	28242	0.	58.	79.	0.	-4.	12.		11.	1.	0.39	1.63	0.05	10.0	6.55	996.5	0	5.8	1.17	81
TIHRSG	28242	0.	24.	113.	0.	31.	-23.		11.	1.	0.58	1.63	0.05	12.9	8.46	1286.8	0	5.8	1.19	80
STIRL	28242	50.	17.	57.	-50.	37.	33.		11.	4.	0.27	1.63	0.14	3.1	2.03	209.3	5	4.9	1.00	114
STIRL	28242	0.	67.	57.	0.	-13.	33.		11.	4.	0.27	1.63	0.14	3.1	2.03	209.5	19	4.6	0.93	112
STIRL	28242	0.	17.	108.	0.	37.	-17.		11.	4.	0.46	1.63	0.14	5.6	3.67	378.6	14	4.3	0.88	101
HEGT85	28242	0.	5.	112.	0.	49.	-21.	A	11.	9.	0.90	1.63	0.19	23.4	15.38	847.8	0	5.9	1.20	111
HEGT60	28242	0.	15.	114.	0.	39.	-24.	A	11.	5.	0.64	1.63	0.10	15.2	9.96	820.8	0	5.5	1.13	96
HEGT00	28242	0.	21.	116.	0.	33.	-26.	A	11.	2.	0.45	1.63	0.05	9.4	6.17	713.7	1	5.2	1.06	83
FCMCCL	28242	0.	16.	103.	0.	38.	-13.		11.	4.	0.62	1.63	0.17	11.4	7.48	803.8	4	5.0	1.02	103
FCSTCL	28242	0.	9.	92.	0.	45.	-1.		11.	7.	0.83	1.63	0.30	14.5	9.50	802.5	5	4.8	0.98	121
IGGTST	28242	0.	14.	105.	0.	40.	-15.		11.	5.	0.69	1.63	0.17	12.6	8.30	751.5	4	5.1	1.04	105
GTSOAR	28242	0.	68.	55.	0	-13.	36.		11.	4.	0.26	1.63	0.15	3.9	2.57	261.2	15	4.5	0.92	111
GTAC08	28242	0.	63.	61.	0.	-9.	29.		11.	4.	0.23	1.63	0.14	3.0	2.00	230.2	21	4.5	0.91	111
GTAC12	28242	0.	65.	54.	0.	-11.	36.		11.	4.	0.24	1.63	0.17	3.4	2.20	234.1	22	4.4	0.89	115
GTAC16	28242	0.	67.	50.	0.	-13.	40.		11.	5.	0.25	1.63	0.19	3.7	2.45	246.3	20	4.4	0.89	116
GTWC16	28242	0.	71.	47.	0.	-17.	43.		11.	5.	0.27	1.63	0.18	4.2	2.75	250.6	16	4.5	0.91	114
CC1626	28242	0.	83.	15.	0.	-29.	75.		11.	9.	0.43	1.63	0.32	6.0	3.94	260.1	15	4.2	0.86	129
CC1622	28242	0.	78.	23.	0.	-24.	68.		11.	8.	0.40	1.63	0.30	5.3	3.51	254.7	16	4.2	0.85	127
CC1222	28242	0.	78.	23.	0.	-24.	67.		11.	8.	0.40	1.63	0.30	5.1	3.36	245.3	17	4.2	0.85	126
CC0822	28242	0.	71.	36.	0.	-17.	54.		11.	7.	0.37	1.63	0.26	4.7	3.05	263.9	17	4.3	0.87	123
STIG15	28242	0.	124.	0.	0.	-70.	90.		11.	11.	0.64	1.63	0.14	7.6	5.00	209.5	0	5.4	1.10	121
STIG15	28242	0.	1769.	0.	0.	-1258.	1622.		11.	198.	3.79	1.63	0.17	59.2	38.84	114.2	0	28.7	5.83	183
STIG10	28242	0.	115.	0.	0.	-61.	90.		11.	11.	0.55	1.63	0.20	6.8	4.48	202.2	4	4.9	1.01	128
STIG10	28242	0.	174.	0.	0.	-102.	150.		11.	18.	0.57	1.63	0.22	8.6	5.68	170.0	0	5.5	1.13	117
STIGIS	28242	0.	110.	2.	0.	-56.	88.		11.	11.	0.43	1.63	0.22	6.0	3.92	186.7	10	4.6	0.94	120
DEADV3	28242	0.	96.	6.	0.	-42.	84.		11.	10.	0.45	1.63	0.29	8.4	5.50	303.6	8	4.6	0.93	124
DEHTPM	28242	0.	66.	45.	0.	-12.	45.		11.	6.	0.37	1.63	0.23	5.9	3.86	380.7	11	4.5	0.92	117
DESOA3	28242	105.	0.	0.	-105.	54.	90.		11.	11.	0.55	1.63	0.27	9.9	6.50	320.9	0	5.7	1.16	136
DESOA3	28242	110.	0.	0.	-110.	55.	95.		11.	12.	0.51	1.63	0.27	10.2	6.68	317.2	0	5.7	1.17	126
DESOA3	28242	0.	105.	0.	0.	-51.	90.		11.	11.	0.55	1.63	0.27	9.9	6.50	320.9	4	5.0	1.01	133
DESOA3	28242	0.	110.	0.	0.	-54.	95.		11.	12.	0.51	1.63	0.27	10.2	6.68	317.2	4	5.0	1.01	122
GTSOAD	28242	49.	17.	56.	-49.	37.	34.		11.	4.	0.24	1.63	0.16	3.1	2.03	216.6	11	4.8	0.97	116
GTRA08	28242	62.	11.	37.	-62.	43.	53.		11.	7.	0.30	1.63	0.24	5.1	3.36	281.1	8	4.8	0.97	122

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTRA12	28242	61.	11.	37.	-61.	43.	53.	11.	6.	0.30	1.63	0.24	5.0	3.30	279.8	8	4.8	0.97	122
GTRA16	28242	59.	12.	41.	-59.	42.	50.	11.	6.	0.30	1.63	0.22	5.1	3.36	294.4	7	4.8	0.96	120
GTR208	28242	54.	14.	48.	-54.	40.	42.	11.	5.	0.27	1.63	0.19	4.1	2.70	258.2	8	4.8	0.96	117
GTR212	28242	57.	14.	45.	-57.	40.	45.	11.	5.	0.28	1.63	0.20	4.4	2.91	267.2	7	4.8	0.96	118
GTR216	28242	57.	13.	44.	-57.	41.	46.	11.	6.	0.28	1.63	0.21	4.6	3.02	277.2	8	4.8	0.96	119
GTRW08	28242	76.	8.	26.	-76.	46.	64.	11.	8.	0.33	1.63	0.24	5.8	3.81	260.4	4	5.0	1.01	123
GTRW12	28242	76.	7.	24.	-76.	47.	66.	11.	8.	0.33	1.63	0.26	5.9	3.87	266.3	5	4.9	1.00	125
GTRW16	28242	72.	8.	28.	-72.	46.	62.	11.	8.	0.33	1.63	0.25	5.9	3.88	279.4	5	4.9	1.00	123
GTR308	28242	65.	12.	42.	-65.	42.	49.	11.	6.	0.29	1.63	0.17	4.6	2.99	238.7	1	5.0	1.02	116
GTR312	28242	67.	11.	35.	-67.	44.	55.	11.	7.	0.30	1.63	0.22	5.0	3.27	254.2	5	4.9	0.99	121
GTR316	28242	67.	11.	36.	-67.	43.	54.	11.	7.	0.31	1.63	0.21	5.2	3.40	266.2	4	4.9	1.00	120
FCPADS	28242	106.	0.	0.	-106.	54.	90.	11.	11.	1.47	1.63	0.27	8.0	5.25	257.2	0	6.5	1.31	142
FCPADS	28242	135.	0.	0.	-135.	64.	124.	11.	15.	1.82	1.63	0.28	9.7	6.39	245.5	0	7.3	1.49	134
FCMCDS	28242	93.	0.	0.	-93.	54.	90.	11.	11.	1.36	1.63	0.35	8.1	5.34	297.8	0	5.9	1.19	150
FCMCDS	28242	99.	0.	0.	-99.	56.	98.	11.	12.	1.38	1.63	0.36	8.4	5.53	291.6	0	5.9	1.21	139

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM EMRG	WRTH
ONOCGN	28651	0.	11.	401.	0.	0.	0.	F	4.	0.	1.73	0.03	0.	29.1	1.00	165.7	0	12.3	1.00	80
STM141	28651	0.	382.	0.	0.	-372.	401.		4.	4.	1.17	0.03	0.07	20.1	0.69	111.0	-18	14.3	1.17	153
STM141	28651	0.	511.	0.	0.	-422.	664.		4.	36.	1.09	0.03	0.32	22.0	0.76	100.7	-5	12.3	1.00	1[illegible]1
STM141	28651	0.	0.	382.	0.	11.	18.	F	4.	4.	2.31	0.03	0.07	35.6	1.22	196.7	1	12.5	1.02	135
STM141	28651	0.	0.	511.	0.	89.	153.	F	4.	36.	2.29	0.03	0.32	40.1	1.38	183.2	21	9.3	0.76	109
STM141	28651	0.	0.	382.	0.	11.	18.	A	4.	4.	2.22	0.03	0.07	33.9	1.16	187.5	5	12.3	1.00	135
STM141	28651	0.	0.	511.	0.	89.	153.	A	4.	36.	2.22	0.03	0.32	34.0	1.17	15[illegible].3	44	8.6	0.70	112
STM088	28651	0.	382.	0.	0.	-372.	401.		4.	4.	1.18	0.03	0.07	19.9	0.68	109.9	-18	14.3	1.16	153
STM088	28651	0.	475.	0.	0.	-408.	591.		4.	28.	1.03	0.03	0.28	20.0	0.69	95.9	-7	12.6	1.03	133
STM088	28651	0.	0.	382.	0.	11.	18.	F	4.	4.	2.33	0.03	0.07	35.8	1.23	197.8	1	12.6	1.02	134
STM088	28651	0.	0.	475.	0.	68.	116.	F	4.	28.	2.15	0.03	0.28	37.3	1.28	179.3	22	9.9	0.80	111
STM088	28651	0.	0.	382.	0.	11.	18.	A	4.	4.	2.25	0.03	0.07	34.0	1.17	187.6	5	12.3	1.00	135
STM088	28651	0.	0.	475.	0.	68.	116.	A	4.	28.	2.15	0.03	0.28	32.7	1.12	157.0	45	9.4	0.76	113
PFBSTM	28651	0.	0.	383.	0.	11.	18.		4.	4.	2.28	0.03	0.07	34.4	1.18	189.8	3	12.4	1.01	135
PFBSTM	28651	0.	0.	595.	0.	137.	230.		4.	56.	3.66	0.03	0.38	47.3	1.62	194.2	15	9.3	0.75	111
TISTMT	28651	0.	383.	0.	0.	-372.	401.		4.	4.	1.36	0.03	0.07	28.7	0.99	158.5	999	15.3	1.26	146
TISTMT	28651	0.	549.	0.	0.	-439.	732.		4.	45.	3.00	0.03	0.35	87.3	3.00	379.8	0	20.8	1.69	120
TISTMT	28651	0.	0.	383.	0.	11.	18.		4.	4.	2.46	0.03	0.07	43.9	1.51	242.5	0	13.6	1.11	132
TISTMT	28651	0	0.	668.	0.	181.	302.		4.	74.	5.16	0.03	0.42	150.8	5.18	569.9	0	20.0	1.62	119
TIHRSG	28651	0.	389.	0.	0.	-378.	401.		4.	4.	1.50	0.03	0.06	36.2	1.24	197.8	0	16.5	1.34	140
TIHRSG	28651	0.	470.	0.	0.	-422.	524.		4.	19.	2.51	0.03	0.18	74.2	2.55	359.2	0	21.1	1.72	115
TIHRSG	28651	0.	0.	389.	0.	11.	12.		4.	4.	2.66	0.03	0.06	53.2	1.83	291.2	0	14.9	1.21	129
TIHRSG	28651	0.	0.	537.	0.	78.	89.		4.	32.	4.36	0.03	0.24	128.6	4.42	568.2	0	22.2	1.81	107
STIRL	28651	391.	0.	0.	-391.	11.	401.		4.	4.	1.16	0.03	0.05	22.8	0.78	124.2	-42	17.3	1.41	153
STIRL	28651	664.	0.	0.	-664.	125.	784.		4.	51.	1.84	0.03	0.27	42.4	1.46	160.8	0	21.2	1.72	124
STIRL	28651	0.	391.	0.	0.	-380.	401.		4.	4.	1.16	0.03	0.05	22.8	0.78	124.2	-25	14.8	1.20	148
STIRL	28651	0.	664.	0.	0.	-539.	784.		4.	51.	1.84	0.03	0.27	42.4	1.46	160.[illegible]	0	16.9	1.37	115
STIRL	28651	0.	0.	391.	0.	11.	10.		4.	4.	2.23	0.03	0.05	36.7	1.26	200.3	0	12.6	1.03	131
STIRL	28651	0.	0.	858.	0.	206.	197.		4.	84.	4.04	0.03	0.32	100.6	3.45	314.1	2	14.4	1.17	100
HEGT85	28651	0.	0.	401.	0.	11.	-0.	A	4.	4.	2.21	0.03	0.03	40.0	1.37	214.4	0	13.2	1.06	127
HEGT85	28651	0.	0.	2527.	0.	637.	-29.	A	4.	260.	9.72	0.03	0.19	256.2	8.80	316.5	0	33.0	2.68	113
HEGT60	28651	0.	0.	400.	0.	11.	1.	A	4.	4.	2.21	0.03	0.03	39.7	1.36	213.0	0	13.2	1.07	128
HEGT60	28651	0.	0.	1305.	0.	287.	20.	A	4.	117.	5.63	0.03	0.19	144.0	4.94	318.1	0	22.5	1.83	96
HEGT00	28651	0.	0.	400.	0.	11.	1.	A	4.	4.	2.23	0.03	0.03	39.3	1.35	211.2	0	13.2	1.07	128
HEGT00	28651	0.	0.	785.	0.	129.	12.	A	4.	53.	3.60	0.03	0.15	85.2	2.93	264.9	0	17.1	1.39	87
FCMCCL	28651	0.	0.	622.	0.	11.	-221.		4.	4.	2.38	0.03	-0.51	43.2	1.48	237.1	0	17.5	1.43	68
FCMCCL	28651	0.	0.	1075.	0.	235.	76.		4.	96.	5.78	0.03	0.22	104.2	3.58	330.8	0	18.6	1.51	96
FCSTCL	28651	0.	0.	621.	0.	11	-220.		4.	4.	2.40	0.03	-0.51	42.4	1.45	232.9	0	17.5	1.42	68
FCSTCL	28651	0.	0.	1332.	0.	380.	303.		4.	155.	7.23	0.03	0.34	129.9	4.46	332.7	1	16.4	1.33	103
IGGTST	28651	0.	0.	626.	0.	11.	-225.		4.	4.	2.35	0.03	-0.52	40.6	1.39	221.2	0	17.3	1.41	67
IGGTST	28651	0.	0.	1242.	0.	267.	18.		4.	109.	3.46	0.03	0.19	101.1	3.47	277.7	0	16.3	1.33	87
GTSOAR	28651	0.	390.	0.	0.	-379.	401.		4.	4.	1.09	0.03	0.05	21.3	0.73	116.1	-20	14.5	1.18	150
GTSOAR	28651	0.	709.	0.	0.	-561.	859.		4.	60.	1.51	0.03	0.30	32.0	1.10	115.6	0	15.1	1.22	121

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----------FUEL USE IN BTU*10**6---------- **COGENERATION CASE**			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC08	28651	0.	387.	0.	0.	-376.	401.	4.	4.	1.08	0.03	0.06	20.7	0.71	113.8	-19	14.4	1.17	151
GTAC08	28651	0.	605.	0.	0.	-487.	757.	4.	48.	1.35	0.03	0.31	26.6	0.91	108.2	-27	13.6	1.11	125
GTAC12	28651	0.	387.	0.	0.	-376.	401.	4.	4.	1.07	0.03	0.06	20.7	0.71	113.5	[illegible]	14.4	1.17	151
GTAC12	28651	0.	664.	0.	0.	-519.	852.	4.	59.	1.46	0.03	0.33	30.4	1.04	115.3	0	13.7	1.12	124
GTAC16	28651	0.	387.	0.	0.	-376.	401.	4.	4.	1.07	0.03	0.06	20.8	0.72	114.2	-19	14.4	1.17	151
GTAC16	28651	0.	707.	0.	0.	-543.	914.	4.	67.	1.55	0.03	0.34	33.7	1.16	122.1	0	14.0	1.14	123
GTWC16	28651	0.	390.	0.	0.	-379.	401.	4.	4.	1.08	0.03	0.05	21.1	0.72	115.3	-20	14.5	1.18	150
GTWC16	28651	0.	767.	0.	0.	-593.	946.	4.	71.	1.55	0.03	0.32	33.0	1.13	112.5	0	15.0	1.22	122
CC1626	28651	0.	390.	0.	0.	-379.	401.	4.	4.	1.14	0.03	0.05	20.9	0.72	113.9	-21	14.6	1.19	150
CC1626	28651	0.	1035.	0.	0.	-747.	1332.	4.	118.	2.00	0.03	0.36	43.3	1.49	116.3	0	15.7	1.28	123
CC1622	28651	0.	389.	0.	0.	-378.	401.	4.	4.	1.14	0.03	0.06	20.6	0.71	112.8	-20	14.5	1.18	151
CC1622	28651	0.	944.	0.	0.	-683.	1236.	4.	106.	1.96	0.03	0.37	43.3	1.49	125.3	0	15.2	1.24	123
CC1222	28651	0.	388.	0.	0.	-378.	401.	4.	4.	1.13	0.03	0.06	20.5	0.70	112.0	-20	14.5	1.18	151
CC1222	28651	0.	936.	0.	0.	-677.	1233.	4.	106.	1.93	0.03	0.37	41.3	1.42	120.3	0	14.8	1.20	123
CC0822	28651	0.	387.	0.	0.	-376.	401.	4.	4.	1.14	0.03	0.06	20.7	0.71	113.3	-20	14.5	1.18	151
CC0822	28651	0.	791.	0.	0.	-584.	1060.	4.	85.	1.75	0.03	0.38	35.3	1.21	117.5	0	13.7	1.11	125
STIG15	28651	0.	40[illegible].	0.	0.	-393.	401.	4.	4.	1.10	0.03	0.02	20.8	0.71	110.9	-21	14.9	1.21	147
STIG15	28651	0.	23846.	0.	0.	-17316.	22226.	4.	2663.	39.42	0.03	0.17	662.2	22.73	93.8	0	309.6	25.17	668
STIG10	28651	0.	400.	0.	0.	-389.	401.	4.	4.	1.09	0.03	0.03	20.6	0.71	110.4	-20	14.8	1.20	148
STIG10	28651	0.	2340.	0.	0.	-1736.	2386.	4.	246.	4.22	0.03	0.22	79.0	2.71	104.6	0	35.7	2.90	134
STIGIS	28651	0.	398.	0.	0.	-388.	401.	4.	4.	1.09	0.03	0.03	20.5	0.70	110.3	-20	14.7	1.19	148
STIGIS	28651	0.	1471.	0.	0.	-1116.	1551.	4.	144.	2.92	0.03	0.23	50.6	1.74	101.1	0	25.0	2.03	122
DEADV3	28651	0.	394.	0.	0.	-384.	401.	4.	4.	1.19	0.03	0.04	24.7	0.85	134.1	-34	15.1	1.23	145
DEADV3	28651	0.	1381.	0.	0.	-1013.	1598.	4.	150.	3.56	0.03	0.30	105.4	3.62	222.5	0	27.8	2.26	124
DEHTPM	28651	0.	386.	0.	0.	-375.	401.	4.	4.	1.23	0.03	0.06	24.8	0.85	136.3	-33	14.9	1.22	147
DEHTPM	[illegible]	0.	719.	0.	0.	-541.	959.	4.	72.	2.38	0.03	0.37	60.[illegible]	2.06	215.0	0	17.0	1.38	119
DESOA3	28651	397.	0.	0.	-397.	11.	401.	4.	4.	1.17	0.03	0.04	23.9	0.82	128.8	-50	17.7	1.44	151
DESOA3	28651	1628.	0.	0.	-1628.	422.	1779.	4.	172.	4.63	0.03	0.26	146.5	5.03	268.2	0	46.8	3.80	154
DESOA3	28651	0.	397.	0.	0.	-386.	401.	4.	4.	1.17	0.03	0.04	23.9	0.82	128.8	-30	15.1	1.23	145
DESOA3	28651	0.	1628.	0.	0.	-1205.	1779.	4.	172.	4.63	0.03	0.26	146.5	5.03	268.2	0	36.3	2.95	132
GTSOAD	28651	388.	0.	0.	-388.	11.	401.	4.	4.	1.07	0.03	0.06	20.5	0.70	112.3	-31	16.9	1.37	156
GTSOAD	28651	666.	0.	0.	-666.	140.	832.	4.	57.	1.39	0.03	0.32	27.5	0.94	104.0	119	18.1	1.47	133
GTRA08	28651	389.	0.	0.	-389.	11.	401.	4.	4.	1.08	0.03	0.05	21.4	0.74	117.0	-35	17.1	1.39	155
GTRA08	28651	875.	0.	0.	-875.	224.	1116.	4.	92.	1.82	0.03	0.35	43.1	1.48	132.6	0	21.3	1.73	132
GTRA12	28651	389.	0.	0.	-389.	11.	401.	4.	4.	1.08	0.03	0.06	21.3	0.73	116.7	-34	17.0	1.38	155
GTRA12	28651	857.	0.	0.	-857.	221.	1103.	4.	90.	1.78	0.03	0.35	41.6	1.43	129.9	0	20.8	1.69	133
GTRA16	28651	389.	0.	0.	-389.	11.	401.	4.	4.	1.09	0.03	0.06	21.5	0.74	117.8	-35	17.1	1.39	155
GTRA16	28651	825.	0.	0.	-825.	207.	1057.	4.	84.	1.78	0.03	0.35	41.9	1.44	134.9	0	20.7	1.68	13[illegible]
GTR208	28651	389.	0.	0.	-389.	11.	401.	4.	4.	1.08	0.03	0.06	21.1	0.72	115.4	-34	17.0	1.38	1[illegible]5
GTR208	28651	751.	0.	0.	-751.	173.	943.	4.	70.	1.58	0.03	0.33	34.2	1.17	118.4	0	19.6	1.59	132
GTR212	28651	389.	0.	0.	-389.	11.	401.	4.	4.	1.08	0.03	0.06	21.2	0.73	116.1	-34	17.0	1.38	155
GTR212	28651	781.	0.	0.	-781.	185.	985.	4.	76.	1.64	0.03	0.33	36.5	1.25	122.4	0	20.0	1.63	132
GTR216	28651	389.	0.	0.	-389.	11.	401.	4.	4.	1.08	0.03	0.06	21.3	0.73	116.6	-34	17.0	1.38	155
GTR216	28651	783.	0.	0.	-783.	190.	1000.	4.	77.	1.69	0.03	0.34	38.6	1.32	129.3	0	20.0	1.63	132

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6 **COGENERATION CASE**			FUEL USE IN BTU*10**6 **NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTRW08	28651	393.	0.	0.	-393.	11.	401.	4.	4.	1.09	0.03	0.05	21.5	0.74	116.7	-36	17.2	1.40	154
GTRW08	28651	1066.	0.	0.	-1066.	269.	1265.	4.	110.	1.86	0.03	0.31	43.1	1.48	113.1	0	24.8	2.01	134
GTRW12	28651	392.	0.	0.	-392.	11.	401.	4.	4.	1.08	0.03	0.05	21.5	0.74	116.9	-35	17.1	1.39	154
GTRW12	28651	1052.	0.	0.	-1052.	275.	1286.	4.	112.	1.86	0.03	0.33	43.6	1.50	115.5	0	23.8	1.94	135
GTRW16	28651	391.	0.	0.	-391.	11.	401.	4.	4.	1.09	0.03	0.05	21.6	0.74	117.9	-36	17.2	1.39	154
GTRW16	28651	1000.	0.	0.	-1000.	257.	1224.	4.	105.	1.85	0.03	0.32	43.3	1.49	119.7	0	23.4	1.90	134
GTR308	28651	394.	0.	0.	-394.	11.	401.	4.	4.	1.08	0.03	0.04	21.2	0.73	114.7	-35	17.2	1.40	154
GTR308	28651	921.	0.	0.	-921.	205.	1052.	4.	84.	1.67	0.03	0.27	36.5	1.25	107.9	0	23.5	1.91	131
GTR312	28651	391.	0.	0.	-391.	11.	401.	4.	4.	1.08	0.03	0.05	21.2	0.73	115.7	-35	17.1	1.39	154
GTR312	28651	918.	0.	0.	-918.	226.	1120.	4.	92.	1.70	0.03	0.32	37.9	1.30	112.2	0	22.1	1.79	133
GTR316	28651	391.	0.	0.	-391.	11.	401.	4.	4.	1.09	0.03	0.05	21.4	0.74	116.8	-35	17.1	1.39	154
GTR316	28651	913.	0.	0.	-913.	222.	1109.	4.	91.	1.72	0.03	0.31	38.9	1.34	115.7	0	22.2	1.81	133
FCPADS	28651	396.	0.	0.	-396.	11.	401.	4.	4.	1.43	0.03	0.04	23.0	0.79	124.3	-46	17.8	1.45	152
FCPADS	28651	1824.	0.	0.	-1824.	498.	2032.	4.	203.	21.50	0.03	0.28	124.1	4.26	205.6	0	62.6	5.09	190
FCMCDS	28651	391.	0.	0.	-391.	11.	[illegible]1.	4.	4.	1.41	0.03	0.05	23.2	0.80	126.4	-46	17.6	1.43	153
FCMCDS	28651	1330.	0.	0.	-1330.	394.	1684.	4.	161.	16.24	0.03	0.36	107.5	3.69	234.2	0	45.9	3.73	168

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		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28653	0.	15.	402.	0.	0.	0.	F	6.	0.	1.27	0.07	0.	20.5	1.00	198.5	0	11.5	1.00	80
STM141	28653	0.	377.	0.	0.	-362.	402.		6.	6.	0.94	0.07	0.10	12.4	0.60	112.0	-19	13.5	1.18	160
STM141	28653	0.	407.	0.	0.	-374.	463.		6.	13.	0.75	0.07	0.18	12.0	0.58	100.7	-14	12.8	1.11	151
STM141	28653	0.	0.	377.	0.	15.	25.	F	6.	6.	1.92	0.07	0.10	28.0	1.36	253.0	5	11.5	1.00	135
STM141	28653	0.	0.	407.	0.	33.	56.	F	6.	13.	1.58	0.07	0.18	25.3	1.23	212.7	23	10.0	0.87	126
STM141	28653	0.	0.	377.	0.	15.	25.	A	6.	6.	1.80	0.07	0.10	24.5	1.20	222.1	13	11.0	0.96	137
STM141	28653	0.	0.	407.	0.	33.	56.	A	6.	13.	1.41	0.07	0.18	18.2	0.89	152.9	999	9.0	0.79	132
STM088	28653	0.	377.	0.	0.	-362.	402.		6.	6.	0.92	0.07	0.10	11.8	0.58	107.1	-18	13.5	1.17	161
STM088	28653	0.	388.	0.	0.	-367.	424.		6.	9.	0.71	0.07	0.13	10.7	0.52	93.7	-14	12.9	1.12	155
STM088	28653	0.	0.	377.	0.	15.	25.	F	6.	6.	1.87	0.07	0.10	27.1	1.32	245.3	7	11.3	0.99	135
STM088	28653	0.	0.	388.	0.	21.	37.	F	6.	9.	1.48	0.07	0.13	23.3	1.14	205.3	29	10.2	0.89	128
STM088	28653	0.	0.	377.	0.	15.	25.	A	6.	6.	1.76	0.07	0.10	22.7	1.11	205.5	24	10.8	0.93	138
STM088	28653	0.	0.	388.	0.	21.	37.	A	6.	9.	1.36	0.07	0.13	17.1	0.83	150.8	999	9.4	0.82	134
PFBSTM	28653	0.	0.	378.	0.	15.	24.		6.	6.	1.99	0.07	0.09	28.1	1.37	253.1	4	11.6	1.01	134
PFBSTM	28653	0.	0.	456.	0.	60.	97.		6.	24.	2.37	0.07	0.26	30.8	1.50	230.5	13	10.1	0.88	117
TISTMT	28653	0.	378.	0.	0.	-363.	402.		6.	6.	1.27	0.07	0.09	26.7	1.30	241.2	0	15.4	1.34	144
TISTMT	28653	0.	492.	0.	0.	-409.	628.		6.	34.	2.37	0.07	0.31	74.9	3.65	519.6	0	19.9	1.73	121
TISTMT	28653	0.	0.	378.	0.	15.	24.		6.	6.	2.24	0.07	0.09	42.9	2.09	387.8	0	13.4	1.17	130
TISTMT	28653	0.	0.	492.	0.	82.	137.		6.	34.	3.39	0.07	0.31	95.0	4.63	659.4	0	17 0	1.47	112
TIHRSG	28653	0.	396.	0.	0.	-381.	402.		6.	6.	1.39	0.07	0.05	34.1	1.66	294.2	0	16.8	1.46	136
TIHRSG	28653	0.	502.	0.	0.	-451.	523.		6.	21.	2.19	0.07	0.13	72.8	3.55	[illegible]	0	22.1	1.92	115
TIHRSG	28653	0.	0.	396.	0.	15.	6.		6.	6.	2.42	0.07	0.05	52.0	2.53	[illegible]	0	14.9	1.30	124
TIHRSG	28653	0.	0.	502.	0	51.	21.		6.	21.	3.23	0.07	0.13	93.2	4.54	[illegible]	0	19.2	1.67	106
STIRL	28653	390.	0.	0.	-390.	15.	402.		6.	6.	0.92	0.07	0.06	14.2	0.69	[illegible]	-44	16.7	1.45	159
STIRL	28653	589.	0.	0.	-589.	93.	663.		6.	38.	1.25	0.07	0.22	31.3	1.53	[illegible]	0	20.1	1.74	123
STIRL	28653	0.	390.	0.	0.	-376.	402.		6.	6.	0.92	0.07	0.06	14.2	0.69	124.5	-26	14.1	1.22	153
STIRL	28653	0.	589.	0.	0.	-496.	663.		6.	38.	1.25	0.07	0.22	31.4	1.53	181.7	0	16.1	1.40	115
STIRL	28653	0.	0.	390.	0.	15.	12.		6.	6.	1.83	0.07	0.06	28.5	1.39	249.5	4	11.6	1.01	130
STIRL	28653	0.	0.	589.	0.	93.	74.		6.	38.	2.43	0.07	0.22	54.7	2.66	316.7	2	12.4	1.08	96
HEGT60	28653	0.	0.	418.	0.	15.	-16.	A	6.	6.	1.92	0.07	-0.00	35.7	1.74	291.5	0	13.0	1.13	120
HEGT60	28653	0.	0.	1999.	0.	372.	-400.	A	6.	152.	6.92	0.07	-0.01	173.2	8.44	295.6	0	32.7	2.84	91
HEGT00	28653	0.	0.	406.	0.	15.	-4.	A	6.	6.	1.90	0.07	0.03	34.5	1.68	290.4	0	12.7	1.10	124
HEGT00	28653	0.	0.	618.	0.	82.	-21.	A	6.	33.	2.61	0.07	0.09	61.8	3.01	325.4	0	15.3	1.33	86
FCMCCL	28653	0.	0.	383.	0.	15.	19.		6.	6.	2.00	0.07	0.08	35.2	1.72	313.7	0	12.5	1.09	130
FCMCCL	28653	0.	0.	638.	0.	139.	182.		6.	57.	3.87	0.07	0.33	71.3	3.47	381.5	2	13.2	1.15	103
FCSTCL	28653	0.	0.	382.	0.	15.	21.		6.	6.	2.03	0.07	0.08	34.6	1.69	309.3	0	12.5	1.08	131
FCSTCL	28653	0.	0.	727.	0.	191.	267.		6.	78.	4.52	0.07	0.39	82.3	4.01	386.3	3	12.6	1.09	105
IGGTST	28653	0.	0.	390.	0.	15.	13.		6.	6.	1.98	0.07	0.07	34.1	1.66	298.6	0	12.5	1.09	129
IGGTST	28653	0.	0.	677.	0.	130.	111.		6.	53.	2.38	0.07	0.26	63.9	3.11	322.0	3	12.3	1.07	94
GTSOAR	28653	0.	392.	0.	0.	-377.	402.		6.	6.	0.87	0.07	0.06	14.3	0.70	124.6	-26	14.1	1.22	153
GTSOAR	28653	0.	784.	0.	0.	-621.	900.		6.	67.	1.12	0.07	0.26	27.6	1.34	120.0	0	15.9	1.39	116
GTAC08	28653	0.	383.	0.	0.	-368.	402.		6.	6.	0.85	0.07	0.08	13.7	0.67	122.5	-22	13.7	1.19	156
GTAC08	28653	0.	582.	0.	0.	-469.	731.		6.	46.	0.89	0.07	0.31	20.0	0.97	117.2	-62	12.8	1.11	126

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		FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC12	28653	0.	383.	0.	0.	-369.	402.	6.	6.	0.85	0.07	0.08	13.7	0.67	122.1	-22	13.7	1.19	156
GTAC12	28653	0.	647.	0.	0.	-505.	828.	6.	58.	1.00	0.07	0.33	23.8	1.16	125.6	0	13.0	1.13	123
GTAC16	28653	0.	385.	0.	0.	-370.	402.	6.	6.	0.85	0.07	0.08	13.9	0.68	123.2	-23	13.8	1.20	155
GTAC16	28653	0.	713.	0.	0.	-548.	907.	6.	68.	1.11	0.07	0.34	27.7	1.35	132.6	0	13.7	1.19	120
GTWC16	28653	0.	387.	0.	0.	-372.	402.	6.	6.	0.86	0.07	0.07	14.2	0.69	123.1	-25	13.9	1.21	154
GTWC16	28653	0.	740.	0.	0.	-572.	914.	6.	68.	1.08	0.07	0.32	26.3	1.28	121.3	0	14.1	1.23	120
CC1626	28653	0.	388.	0.	0.	-373.	402.	6.	6.	0.93	0.07	0.07	14.0	0.68	122.9	-26	14.0	1.22	154
CC1626	28653	0.	928.	0.	0.	-685.	1167.	6.	99.	1.43	0.07	0.34	33.4	1.63	122.9	0	15.1	1.31	119
CC1622	28653	0.	386.	0.	0.	-372.	402.	6.	6.	0.92	0.07	0.07	13.7	0.67	121.2	-25	13.9	1.21	155
CC1622	28653	0.	847.	0.	0.	-629.	1083.	6.	89.	1.39	0.07	0.35	33.2	1.62	133.7	0	14.5	1.26	119
CC1222	28653	0.	386.	0.	0.	-371.	402.	6.	6.	0.92	0.07	0.07	13.5	0.66	119.5	-24	13.9	1.21	156
CC1222	28653	0.	839.	0.	0.	-623.	1078.	6.	88.	1.36	0.07	0.35	31.4	1.53	127.7	0	14.2	1.24	120
CC0622	28653	0.	384.	0.	0.	-369	402.	6.	6.	0.93	0.07	0.06	13.7	0.67	122.0	-24	13.9	1.20	156
CC0622	28653	0.	709.	0.	0.	-539.	923.	6.	69.	1.20	0.07	0.35	26.0	1.27	125.2	0	13.2	1.14	122
DEHTP1	28653	0.	390.	0.	0.	-375.	402.	6.	6.	1.04	0.07	0.06	18.1	0.88	158.3	-57	14.6	1.27	148
DEHTP1	28653	0.	695.	0.	0.	-559.	808.	6.	55.	1.89	0.07	0.26	52.6	2.56	258.3	0	18.8	1.64	111
GTS0AD	28653	386.	0.	0.	-366.	15.	402.	6.	6.	0.84	0.07	0.07	13.5	0.66	119.1	-39	16.4	1.42	161
GTS0AD	28653	662.	0.	0.	-662.	139.	818.	6.	57.	0.93	0.07	0.31	21.2	1.03	109.4	0	17.8	1.55	133
GTRA08	28653	392.	0.	0.	-392.	15.	402.	6.	6.	0.86	0.07	0.06	14.4	0.70	125.7	-45	16.7	1.45	158
GTRA08	28653	1094.	0.	0.	-1094.	281.	1293.	6.	115.	1.55	0.07	0.30	42.8	2.09	133.5	0	25.5	2.22	132
GTRA12	28653	390.	0.	0.	-390.	15.	402.	6.	6.	0.86	0.07	0.06	14.4	0.70	125.9	-45	16.7	1.45	159
GTRA12	28653	1018.	0.	0.	-1018.	262.	1230.	6.	107.	1.47	0.07	0.32	40.0	1.95	134.1	0	23.8	2.07	132
GTRA16	28653	390.	0.	0.	-390.	15.	402.	6.	6.	0.87	0.07	0.07	14.7	0.71	128.5	-46	16.7	1.45	158
GTRA16	28653	943.	0.	0.	-913.	236.	1144.	6.	96.	1.44	0.07	0.32	39.3	1.91	142.2	0	22.9	1.99	130
GTR203	28653	389.	0.	0.	-389.	15.	402.	6.	6.	0.86	0.07	0.07	14.1	0.69	123.9	-43	16.6	1.44	159
GTR203	28653	811.	0.	0.	-811.	186.	977.	6.	76.	1.17	0.07	0.30	29.6	1.44	124.5	0	20.7	1.80	130
GTR212	28653	389.	0.	0.	-389.	15.	402.	6.	6.	0.86	0.07	0.07	14.3	0.70	125.3	-44	16.6	1.44	159
GTR212	28653	845.	0.	0.	-815.	200.	1024.	6.	82.	1.24	0.07	0.31	32.0	1.56	129.2	0	21.2	1.84	130
GTR216	28653	389.	0.	0.	-389.	15.	402.	6.	6.	0.86	0.07	0.07	14.4	0.70	126.5	-44	16.6	1.44	159
GTR216	28653	853.	0.	0.	-853.	207.	1045.	6.	84.	1.30	0.07	0.32	34.4	1.68	137.8	0	21.3	1.85	129
GTRW03	28653	395.	0.	0.	-395.	15.	402.	6.	6.	0.86	0.07	0.05	14.5	0.71	125.3	-47	16.9	1.47	157
GTRW03	28653	1294.	0.	0.	-1294.	326.	1446.	6.	133.	1.57	0.07	0.27	42.1	2.05	111.0	0	29.3	2.54	136
GTRW12	28653	393.	0.	0.	-393.	15.	402.	6.	6.	0.86	0.07	0.06	14.5	0.71	126.1	-46	16.8	1.46	158
GTRW12	28653	1218.	0.	0.	-1218.	319.	1419.	6.	130.	1.54	0.07	0.30	41.3	2.01	115.7	0	27.0	2.34	135
GTRW16	28653	392.	0.	0.	-392.	15.	402.	6.	6.	0.87	0.07	0.06	14.7	0.72	128.3	-47	16.8	1.46	156
GTRW16	28653	1108.	0.	0.	-1108.	284.	1305.	6.	116.	1.48	0.07	0.30	39.8	1.94	122.7	0	25.4	2.21	133
GTR308	28653	397.	0.	0.	-397.	15.	402.	6.	6.	0.86	0.07	0.05	14.2	0.69	122.0	-45	16.9	1.47	157
GTR308	28653	1077.	0.	0.	-1077.	240.	1156.	6.	98.	1.32	0.07	0.23	33.7	1.64	106.7	0	26.9	2.34	131
GTR312	28653	391.	0.	0.	-391.	15.	402.	6.	6.	0.86	0.07	0.06	14.3	0.70	124.7	-44	16.6	1.45	159
GTR312	28653	951.	0.	0.	-951.	234.	1136.	6.	95.	1.28	0.07	0.31	32.6	1.59	116.9	0	22.6	1.96	132
GTR316	28653	391.	0.	0.	-391.	15.	402.	6.	6.	0.86	0.07	0.06	14.5	0.71	126.7	-45	16.7	1.45	158
GTR316	28653	942.	0.	0.	-942.	230.	1122.	6.	94.	1.30	0.07	0.30	33.5	1.63	121.4	0	22.7	1.97	131
FCPADS	28653	396.	0.	0.	-396.	15.	402.	6.	6.	1.35	0.07	0.05	15.3	0.74	131.7	-57	17.4	1.52	157
FCPADS	28653	1765.	0.	0.	-1765.	482.	1967.	6.	197.	21.02	0.07	0.28	113.7	5.54	219.9	0	61.5	5.34	194

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		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
FCMCDS	26653	389.	0.	0.	-389.	15.	402.	6.	6.	1.31	0.07	0.07	15.6	0.76	136.4	-57	17.2	1.49	158
FCMCDS	26653	1288.	0.	0.	-1288.	381.	1629.	6.	155.	15.76	0.07	0.36	97.8	4.77	259.3	0	44.9	3.90	169

		----------FUEL USE IN BTU*10**6----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28654	0.	2.	265.	0.	0.	0.	F	1.	0.	1.07	0.01	0.	16.7	1.00	220.8	0	7.4	1.00	80
STM141	28654	0	262.	0.	0.	-260.	265.		1.	1.	0.72	0.01	0.02	8.4	0.50	109.0	-17	9.1	1.23	157
STM141	28654	0.	278.	0.	0.	-266.	298.		1.	5.	0.62	0.01	0.10	8.6	0.51	105.5	-15	8.8	1.19	121
STM141	28654	0.	0.	262.	0.	2.	3.	F	1.	1.	1.46	0.01	0.02	19.8	1.18	257.9	0	8.0	1.07	130
STM141	28654	0.	0.	278.	0.	12.	20.	F	1.	5.	1.24	0.01	0.10	18.6	1.11	228.6	14	7.1	0.97	95
STM141	28654	0.	0.	262.	0.	2.	3.	A	1.	1.	1.40	0.01	0.02	19.1	1.14	249.5	0	7.8	1.06	130
STM141	28654	0.	0.	278.	0.	12.	20.	A	1.	5.	1.10	0.01	0.10	13.6	0.81	166.4	999	6.5	0.87	101
PFBSTM	28654	0.	0.	262.	0.	2.	3.		1.	1.	1.35	0.01	0.02	18.8	1.12	244.7	0	7.8	1.05	130
PFBSTM	28654	0.	0.	314.	0.	31.	48.		1.	13.	1.77	0.01	0.20	23.2	1.39	252.6	5	7.4	0.99	97
TISTMT	28654	0.	262.	0.	0.	-260.	265.		1.	1.	0.72	0.01	0.02	10.4	0.62	135.1	-22	9.4	1.26	152
TISTMT	28654	0.	336.	0.	0.	-291.	411.		1.	19.	1.83	0.01	0.26	55.5	3.31	563.5	0	14.2	1.92	112
TISTMT	28654	0.	0.	262.	0.	2.	3.		1.	1.	1.41	0.01	0.02	21.2	1.26	276.0	0	8.1	1.09	129
TISTMT	28654	0.	0.	336.	0.	45.	75.		1.	19.	2.60	0.01	0.26	70.8	4.23	718.9	0	12.6	1.70	104
TIHRSG	28654	0.	264.	0.	0.	-262.	265.		1.	1.	0.69	0.01	0.01	11.3	0.67	146.0	-25	9.5	1.28	149
TIHRSG	28654	0.	368.	0.	0.	-331.	383.		1.	15.	1.77	0.01	0.13	57.7	3.45	535.0	0	15.8	2.13	100
TIHRSG	28654	0.	0.	264.	0.	2.	1.		1.	1.	1.38	0.01	0.01	22.4	1.34	289.4	0	8.2	1.11	127
TIHRSG	28654	0.	0.	368.	0.	37.	15.		1.	15.	2.60	0.01	0.13	74.0	4.42	686.5	0	14.1	1.90	91
STIRL	28654	263.	0.	0.	-263.	2.	265.		1.	1.	0.64	0.01	0.01	9.0	0.54	116.8	-28	10.9	1.47	160
STIRL	28654	432.	0.	0.	-432.	68.	486.		1.	28.	1.00	0.01	0.22	23.2	1.39	183.7	0	13.7	1.85	121
STIRL	28654	0.	263.	0.	0.	-261.	265.		1.	1.	0.64	0.01	0.01	9.0	0.54	116.8	-18	9.2	1.24	154
STIRL	28654	0.	432.	0.	0.	-364.	486.		1.	28.	1.00	0.01	0.22	23.3	1.39	184.0	0	10.9	1.48	112
STIRL	28654	0.	0.	263.	0.	2.	1.		1.	1.	1.30	0.01	0.01	19.4	1.16	252.0	0	7.7	1.05	129
STIRL	28654	0.	0.	432.	0.	68.	55.		1.	28.	1.91	0.01	0.22	41.2	2.46	325.4	0	8.5	1.15	92
HEGT60	28654	0.	0.	266.	0.	2.	-2.	A	1.	1.	1.23	0.01	-0.00	19.0	1.13	243.1	0	7.7	1.04	128
HEGT60	28654	0.	0.	1466.	0.	273.	-294.	A	1.	111.	5.43	0.01	-0.01	139.1	8.31	323.7	0	24.8	3.34	104
HEGT00	28654	0.	0.	265.	0.	2.	-0.	A	1.	1.	1.23	0.01	0.00	18.9	1.13	242.9	0	7.7	1.04	129
HEGT00	28654	0.	0.	475.	0.	60.	-15.	A	1.	25.	2.07	0.01	0.09	49.6	2.96	356.3	0	11.0	1.49	81
FCMCCL	28654	0.	0.	262.	0.	2.	2.		1.	1.	1.31	0.01	0.01	21.5	1.28	279.7	0	8.1	1.09	128
FCMCCL	28654	0.	0.	468.	0.	102.	133.		1.	42.	3.00	0.01	0.33	57.0	3.40	415.8	0	9.6	1.30	105
FCSTCL	28654	0.	0.	262.	0.	2.	2.		1.	1.	1.35	0.01	0.02	21.4	1.28	278.7	0	8.1	1.09	128
FCSTCL	28654	0.	0.	498.	0.	121.	165.		1.	49.	3.31	0.01	0.36	61.6	3.68	421.7	0	9.6	1.29	106
IGGTST	28654	0.	0.	263.	0.	2.	1.		1.	1.	1.38	0.01	0.01	20.8	1.24	269.0	0	8.1	1.09	128
IGGTST	28654	0.	0.	463.	0.	78.	58.		1.	32.	1.91	0.01	0.23	48.4	2.89	356.6	0	9.3	1.26	93
GTSOAR	28654	0.	263.	0.	0.	-262.	265.		1.	1.	0.60	0.01	0.01	8.3	0.50	107.6	-16	9.0	1.22	156
GTSOAR	28654	0.	575.	0.	0.	-455.	660.		1.	49.	0.93	0.01	0.26	21.9	1.31	130.1	0	11.0	1.48	118
GTAC08	28654	0.	262.	0.	0.	-261.	265.		1.	1.	0.59	0.01	0.01	8.2	0.49	106.4	-16	9.0	1.21	156
GTAC08	28654	0.	427.	0.	0.	-344.	536.		1.	34.	0.74	0.01	0.31	15.9	0.95	127.0	-52	8.6	1.17	124
GTAC12	28654	0.	262.	0.	0.	-261.	265.		1.	1.	0.59	0.01	0.01	8.1	0.49	105.6	-16	9.0	1.21	157
GTAC12	28654	0.	475.	0.	0.	-371.	607.		1.	42.	0.83	0.01	0.33	18.8	1.12	134.9	0	8.8	1.19	124
GTAC16	28654	0.	263.	0.	0.	-261.	265.		1.	1.	0.59	0.01	0.01	8.1	0.49	105.7	-16	9.0	1.21	156
GTAC16	28654	0.	523.	0.	0.	-402.	665.		1.	50.	0.92	0.01	0.34	21.8	1.30	142.1	0	9.3	1.26	122
GTWC16	28654	0.	263.	0.	0.	-261.	265.		1.	1.	0.59	0.01	0.01	8.3	0.49	107.5	-16	9.0	1.22	156
GTWC16	28654	0.	542.	0.	0.	-420.	670.		1.	50.	0.90	0.01	0.32	21.0	1.26	132.3	0	9.7	1.31	122

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
DEHTPM	28654	0.	263.	0.	0.	-261.	265.	1.	1.	0.66	0.01	0.01	9.3	0.55	120.4	-19	9.2	1.24	153
DEHTPM	28654	0.	510.	0.	0.	-410.	593.	1.	41.	1.49	0.01	0.26	38.9	2.32	260.2	0	13.0	1.75	113
GTSOAD	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.1	0.48	105.2	-25	10.7	1.44	162
GTSOAD	28654	485.	0.	0.	-485.	102.	600.	1.	42.	0.78	0.01	0.31	16.8	1.00	118.3	999	12.2	1.65	135
GTRA08	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.3	0.50	107.9	-26	10.7	1.45	161
GTRA08	28654	803.	0.	0.	-803.	206.	948.	1.	84.	1.28	0.01	0.30	34.0	2.03	144.7	0	18.0	2.42	138
GTRA12	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.3	0.49	107.1	-26	10.7	1.45	162
GTRA12	28654	747.	0.	0.	-747.	192.	902.	1.	78.	1.21	0.01	0.32	31.6	1.89	144.3	0	16.7	2.25	137
GTRA16	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.3	0.50	108.0	-26	10.7	1.45	161
GTRA16	28654	691.	0.	0.	-691.	173.	839.	1.	71.	1.19	0.01	0.32	31.0	1.85	153.2	0	16.0	2.17	135
GTR208	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.2	0.49	106.9	-26	10.7	1.45	162
GTR208	28654	595.	0.	0.	-595.	137.	717.	1.	56.	0.97	0.01	0.30	23.4	1.40	134.4	0	14.3	1.94	133
GTR212	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.3	0.49	107.2	-26	10.7	1.45	162
GTR212	28654	619.	0.	0.	-619.	147.	751.	1.	60.	1.03	0.01	0.31	25.3	1.51	139.5	0	14.7	1.99	134
GTR216	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.3	0.49	107.3	-26	10.7	1.45	162
GTR216	28654	626.	0.	0.	-626.	152.	766.	1.	62.	1.08	0.01	0.32	27.2	1.62	148.2	0	14.8	2.00	134
GTRW08	28654	264.	0.	0.	-264.	2.	265.	1.	1.	0.59	0.01	0.01	8.3	0.50	108.0	-26	10.8	1.45	161
GTRW08	28654	949.	0.	0.	-949.	239.	1060.	1.	98.	1.30	0.01	0.27	33.7	2.01	121.0	0	20.6	2.78	143
GTRW12	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.4	0.50	108.1	-26	10.8	1.45	161
GTRW12	28654	893.	0.	0.	-893.	234.	1041.	1.	95.	1.28	0.01	0.30	33.0	1.97	126.2	0	19.0	2.56	141
GTRW16	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.4	0.50	109.0	-26	10.8	1.45	161
GTRW16	28654	813.	0.	0.	-813.	208.	957.	1.	85.	1.23	0.01	0.30	31.9	1.90	134.0	0	17.8	2.41	138
GTR308	28654	264.	0.	0.	-264.	2.	265.	1.	1.	0.59	0.01	0.01	8.2	0.49	106.5	-26	10.8	1.45	161
GTR308	28654	790.	0.	0.	-790.	176.	848.	1.	72.	1.10	0.01	0.23	26.8	1.60	116.0	0	18.8	2.54	136
GTR312	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.3	0.50	107.7	-26	10.7	1.45	161
GTR312	28654	698.	0.	0.	-698.	171.	833.	1.	70.	1.06	0.01	0.31	26.0	1.55	127.3	0	15.8	2.13	136
GTR316	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.59	0.01	0.01	8.4	0.50	108.4	-26	10.7	1.45	161
GTR316	28654	691.	0.	0.	-691.	168.	822.	1.	69.	1.08	0.01	0.30	26.8	1.60	132.4	0	15.9	2.14	135
FCPADS	28654	264.	0.	0.	-264.	2.	265.	1.	1.	0.63	0.01	0.01	9.0	0.54	116.1	-28	10.9	1.47	160
FCPADS	28654	1294.	0.	0.	-1294.	353.	1442.	1.	144.	15.00	0.01	0.28	84.3	5.03	222.2	0	43.3	5.85	207
FCMCDS	28654	263.	0.	0.	-263.	2.	265.	1.	1.	0.62	0.01	0.01	9.0	0.54	116.8	-28	10.8	1.46	160
FCMCDS	28654	944.	0.	0.	-944.	280.	1195.	1.	114.	11.26	0.01	0.36	72.3	4.32	261.4	0	31.5	4.25	179

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

ECS	PROCS	FUEL USE IN BTU*10**6: **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28691	0.	4.	12.	0.	0.	0. F	2.	0.	0.81	0.04	0.	12.0	1.00	262.8	0	2.6	1.00	80
PFBSTM	28691	0.	0.	0.	0.	4.	12.	2.	2.	1.24	0.04	1.00	15.9	1.32	332.5	0	3.0	1.15	252
PFBSTM	28691	0.	0.	0.	0.	15.	49.	2.	6.	1.24	0.04	1.00	16.0	1.33	297.1	12	2.1	0.83	212
TIHRSG	28691	0.	0.	0.	0.	4.	12.	2.	2.	1.32	0.04	1.00	23.3	1.93	469.7	0	3.8	1.49	252
TIHRSG	28691	0.	0.	0.	0.	24.	81.	2.	10.	1.94	0.04	1.00	53.8	4.46	767.7	0	6.2	2.43	219
HEGT00	28691	0.	0.	0.	0.	4.	12. A	2.	2.	1.09	0.04	1.00	17.1	1.42	342.9	0	2.9	1.14	250
HEGT00	28691	0.	0.	0.	0.	37.	125. A	2.	15.	1.49	0.04	1.00	35.5	2.95	409.4	4	2.8	1.10	187
FCMCCL	28691	0.	0.	284.	0.	62.	-76.	2.	25.	2.06	0.04	-0.05	39.9	3.31	478.4	0	6.9	2.67	91
GTSOAR	28691	0.	18.	0.	0.	-14.	12.	2.	2.	0.54	0.04	-0.10	6.8	0.56	138.9	999	1.8	0.68	125
GTAC08	28691	0.	19.	0.	0.	-15.	12.	2.	2.	0.53	0.04	-0.19	6.5	0.54	135.2	999	1.8	0.68	116
GTAC12	28691	0.	17.	0.	0.	-13.	12.	2.	2.	0.52	0.04	-0.05	6.4	0.53	134.0	999	1.7	0.66	132
GTAC16	28691	0.	16.	0.	0.	-12.	12.	2.	2.	0.52	0.04	0.01	6.5	0.54	134.4	999	1.7	0.65	139
GTWC16	28691	0.	16.	0.	0.	-13.	12.	2.	2.	0.53	0.04	-0.02	6.7	0.55	138.3	999	1.7	0.66	135
GTSOAD	28691	18.	0.	0.	-18.	4.	12.	2.	2.	0.52	0.04	-0.10	6.4	0.53	132.2	999	1.8	0.71	128
GTRA08	28691	14.	0.	0.	-14.	4.	12.	2.	2.	0.53	0.04	0.10	6.8	0.57	139.1	999	1.8	0.68	150
GTRA12	28691	14.	0.	0.	-14.	4.	12.	2.	2.	0.53	0.04	0.11	6.7	0.56	138.3	999	1.7	0.68	151
GTRA16	28691	15.	0.	0.	-15.	4.	12.	2.	2.	0.53	0.04	0.08	6.9	0.57	140.9	999	1.8	0.69	148
GTR208	28691	16.	0.	0.	-16.	4.	12.	2.	2.	0.53	0.04	-0.00	6.7	0.56	137.8	999	1.8	0.70	138
GTR212	28691	16.	0.	0.	-16.	4.	12.	2.	2.	0.53	0.04	0.03	6.8	0.56	138.9	999	1.8	0.70	142
GTR216	28691	15.	0.	0.	-15.	4.	12.	2.	2.	0.53	0.04	0.05	6.8	0.56	139.4	999	1.8	0.69	144
GTRW08	28691	15.	0.	0.	-15.	4.	12.	2.	2.	0.53	0.04	0.09	6.9	0.57	139.7	999	1.8	0.69	148
GTRW12	28691	14.	0.	0.	-14.	4.	12.	2.	2.	0.53	0.04	0.12	6.9	0.57	140.6	999	1.8	0.68	152
GTRW16	28691	14.	0.	0.	-14.	4.	12.	2.	2.	0.53	0.04	0.10	7.0	0.58	143.0	999	1.8	0.69	150
GTR308	28691	17.	0.	0.	-17.	4.	12.	2.	2.	0.53	0.04	-0.03	6.7	0.55	135.0	999	1.8	0.71	135
GTR312	28691	15.	0.	0.	-15.	4.	12.	2.	2.	0.53	0.04	0.06	6.8	0.57	139.9	999	1.8	0.69	146
GTR316	28691	15.	0.	0.	-15.	4.	12.	2.	2.	0.53	0.04	0.06	6.9	0.57	141.9	999	1.8	0.70	144
FCPADS	28691	13.	0.	0.	-13.	4.	12.	2.	2.	0.62	0.04	0.16	7.0	0.58	142.2	999	1.8	0.71	157
FCMCDS	28691	12.	0.	0.	-12.	4.	12.	2.	2.	0.60	0.04	0.22	7.0	0.58	145.0	999	1.8	0.69	165

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ECS	PROCS	FUEL USE IN BTU*10**6 — **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28692	0.	14.	223.	0.	0.	0.	F	6.	0.	0.87	0.13	0.	13.0	1.00	252.0	0	7.0	1.00	80
PFBSTM	28692	0.	2.	207.	0.	12.	16.		6.	5.	1.29	0.13	0.12	16.2	1.24	276.5	11	6.7	0.96	127
TIHRSG	28692	0.	226.	0.	0.	-212.	223.		6.	6.	1.21	0.13	0.05	30.6	2.35	461.0	0	10.9	1.57	132
TIHRSG	28692	0.	276.	0.	0.	-248.	270.		6.	11.	1.46	0.13	0.07	46.5	3.57	575.5	0	13.3	1.91	121
TIHRSG	28692	0.	0.	226.	0.	14.	-3.		6.	6.	1.95	0.13	0.05	43.4	3.33	654.0	0	10.4	1.50	124
TIHRSG	28692	0.	0.	276.	0.	28.	-6.		6.	11.	2.14	0.13	0.07	59.8	4.59	739.5	0	12.2	1.75	114
HEGT00	28692	0.	0.	229.	0.	14.	-6.	A	6.	6.	1.46	0.13	0.04	26.8	2.05	399.1	0	8.2	1.18	123
HEGT00	28692	0.	0.	336.	0.	43.	-17.	A	6.	17.	1.63	0.13	0.07	38.8	2.98	394.3	0	9.3	1.34	100
FCMCCL	28692	0.	0.	205.	0.	14.	18.		6.	6.	1.52	0.13	0.13	25.8	1.98	429.2	0	7.8	1.12	135
FCMCCL	28692	0.	0.	321.	0.	70.	90.		6.	29.	2.25	0.13	0.33	43.5	3.34	462.1	1	8.3	1.19	114
GTSOAR	28692	0.	217.	0.	0.	-203.	223.		6.	6.	0.67	0.13	0.09	9.4	0.72	148.3	-19	7.9	1.14	153
GTSOAR	28692	0.	444.	0.	0.	-351.	486.		6.	38.	0.80	0.13	0.23	17.9	1.37	137.6	0	9.6	1.38	117
GTAC08	28692	0.	205.	0.	0.	-191.	223.		6.	6.	0.65	0.13	0.14	8.7	0.67	145.0	-12	7.5	1.07	160
GTAC08	28692	0.	293.	0.	0.	-236.	367.		6.	23.	0.60	0.13	0.31	11.9	0.92	139.3	-11	7.1	1.02	139
GTAC12	28692	0.	205.	0.	0.	-191.	223.		6.	6.	0.64	0.13	0.14	8.7	0.67	145.3	-12	7.5	1.07	160
GTAC12	28692	0.	319.	0.	0.	-249.	411.		6.	29.	0.66	0.13	0.34	13.8	1.06	147.7	0	7.1	1.02	133
GTAC16	28692	0.	207.	0.	0.	-193.	223.		6.	6.	0.65	0.13	0.13	8.9	0.68	146.7	-14	7.5	1.09	158
GTAC16	28692	0.	361.	0.	0.	-277.	457.		6.	34.	0.73	0.13	0.33	16.3	1.25	153.7	0	7.6	1.10	127
GTWC16	28692	0.	209.	0.	0.	-195.	223.		6.	6.	0.66	0.13	0.12	9.2	0.71	150.5	-15	7.6	1.10	157
GTWC16	28692	0.	369.	0.	0.	-286.	456.		6.	34.	0.73	0.13	0.32	15.9	1.22	146.9	0	7.8	1.13	126
GTSOAD	28692	207.	0.	0.	-207.	14.	223.		6.	6.	0.64	0.13	0.13	8.5	0.65	139.5	-27	8.8	1.27	164
GTSOAD	28692	330.	0.	0.	-330.	69.	408.		6.	28.	0.63	0.13	0.31	12.6	0.96	130.0	148	9.5	1.36	141
GTRA08	28692	218.	0.	0.	-218.	14.	223.		6.	6.	0.67	0.13	0.08	9.5	0.73	149.2	-38	9.4	1.34	157
GTRA08	28692	741.	0.	0.	-741.	190.	813.		6.	78.	1.16	0.13	0.26	29.7	2.28	136.8	0	17.3	2.49	132
GTRA12	28692	216.	0.	0.	-216.	14.	223.		6.	6.	0.67	0.13	0.09	9.5	0.73	150.5	-37	9.3	1.33	158
GTRA12	28692	635.	0.	0.	-635.	163.	724.		6.	67.	1.09	0.13	0.28	27.5	2.11	147.8	0	15.2	2.19	129
GTRA16	28692	215.	0.	0.	-215.	14.	223.		6.	6.	0.67	0.13	0.10	9.8	0.75	155.6	-39	9.3	1.33	158
GTRA16	28692	556.	0.	0.	-556.	140.	644.		6.	57.	1.03	0.13	0.29	26.0	2.00	159.6	0	14.0	2.02	128
GTR208	28692	213.	0.	0.	-213.	14.	223.		6.	6.	0.66	0.13	0.10	9.3	0.71	148.3	-34	9.1	1.31	160
GTR208	28692	444.	0.	0.	-444.	102.	518.		6.	42.	0.82	0.13	0.28	18.6	1.43	143.3	0	11.9	1.71	129
GTR212	28692	213.	0.	0.	-213.	14.	223.		6.	6.	0.66	0.13	0.10	9.4	0.72	150.8	-35	9.2	1.32	159
GTR212	28692	465.	0.	0.	-465.	110.	545.		6.	45.	0.86	0.13	0.29	20.2	1.55	148.6	0	12.2	1.76	129
GTR216	28692	213.	0.	0.	-213.	14.	223.		6.	6.	0.67	0.13	0.10	9.5	0.73	152.9	-36	9.2	1.32	159
GTR216	28692	474.	0.	0.	-474.	115.	561.		6.	47.	0.90	0.13	0.30	21.8	1.67	157.0	0	12.4	1.78	128
GTRW08	28692	220.	0.	0.	-220.	14.	223.		6.	6.	0.67	0.13	0.07	9.6	0.74	149.5	-40	9.4	1.36	156
GTRW08	28692	834.	0.	0.	-834.	210.	881.		6.	86.	1.19	0.13	0.24	30.2	2.32	123.6	0	19.2	2.75	135
GTRW12	28692	217.	0.	0.	-217.	14.	223.		6.	6.	0.67	0.13	0.09	9.7	0.74	151.9	-39	9.3	1.34	157
GTRW12	28692	732.	0.	0.	-732.	192.	818.		6.	78.	1.13	0.13	0.27	28.3	[illegible]	131.9	0	16.7	2.40	133
GTRW16	28692	216.	0.	0.	-216.	14.	223.		6.	6.	0.67	0.13	0.09	9.9	0.76	156.3	-40	9.3	1.34	157
GTRW16	28692	628.	0.	0.	-628.	161.	716.		6.	66.	1.05	0.13	0.28	26.3	2.02	143.0	0	15.0	2.16	129
GTR308	28692	221.	0.	0.	-221.	14.	223.		6.	6.	0.67	0.13	0.07	9.2	0.71	142.6	-37	9.4	[illegible]	156
GTR308	28692	621.	0.	0.	-621.	138.	640.		6.	56.	0.95	0.13	0.20	22.2	1.70	121.9	0	15.9	2.29	127
GTR312	28692	213.	0.	0.	-213.	14.	223.		6.	6.	0.66	0.13	0.10	9.4	0.72	150.9	-35	9.2	1.32	159

SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTR312	28692	498.	0.	0.	-498.	122.	586.	6.	50.	0.87	0.13	0.30	20.3	1.56	139.5	0	12.5	1.80	129
GTR316	28692	213.	0.	0.	-213.	14.	223.	6.	6.	0.67	0.13	0.10	9.7	0.74	154.5	-37	9.2	1.32	159
GTR316	28692	491.	0.	0.	-491.	120.	577.	6.	49.	0.89	0.13	0.30	20.9	1.61	145.5	0	12.5	1.80	129
FCPADS	28692	217.	0.	0.	-217.	14.	223.	6.	6.	1.09	0.13	0.08	9.8	0.75	154.2	-46	9.8	1.41	158
FCPADS	28692	882.	0.	0.	-882.	241.	983.	6.	98.	10.30	0.13	0.28	58.1	4.46	224.6	0	30.6	4.40	172
FCMCDS	28692	211.	0.	0.	-211.	14.	223.	6.	6.	1.06	0.13	0.11	10.1	0.77	163.0	-46	9.5	1.37	160
FCMCDS	28692	644.	0.	0.	-614.	191.	815.	6.	78.	7.74	0.13	0.36	50.1	3.84	265.6	0	22.6	3.25	155

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	28698	0.	9.	400.	0.	0.	0.	F	4.	0.	1.38	0.04	0.	22.7	1.00	188.3	0	11.1	1.00	80
STM141	28693	0.	385.	0.	0.	-376.	400.		4.	4.	0.96	0.04	0.06	13.7	0.60	109.3	-20	13.5	1.21	156
STM141	28693	0.	445.	0.	0.	-400.	523.		4.	19.	0.86	0.04	0.22	15.6	0.69	109.6	-17	12.6	1.13	132
STM141	28693	0.	0.	385.	0.	9.	15.	F	4.	4.	1.94	0.04	0.06	28.6	1.26	229.4	0	11.5	1.03	133
STM141	28693	0.	0.	445.	0.	46.	78.	F	4.	19.	1.75	0.04	0.22	29.1	1.28	204.0	19	9.6	0.86	109
STM141	28693	0.	0.	385.	0.	9.	15.	A	4.	4.	1.85	0.04	0.06	26.9	1.18	215.3	4	11.2	1.01	133
STM141	28693	0.	0.	445.	0.	46.	78.	A	4.	19.	1.57	0.04	0.22	20.7	0.91	145.4	999	8.5	0.76	115
STM088	28693	0.	385.	0.	0.	-376.	400.		4.	4.	0.94	0.04	0.06	12.2	0.54	97.9	-17	13.3	1.20	159
STM088	28693	0.	423.	0.	0.	-391.	477.		4.	13.	0.82	0.04	0.17	13.9	0.61	102.4	-16	12.8	1.15	138
STM088	28693	0.	0.	385.	0.	9.	15.	F	4.	4.	1.96	0.04	0.06	28.9	1.27	231.0	0	11.5	1.04	132
STM088	28693	0.	0.	423.	0.	32.	54.	F	4.	13.	1.64	0.04	0.17	26.9	1.18	197.8	22	9.9	0.89	115
STM088	28693	0.	0.	385.	0.	9.	15.	A	4.	4.	1.88	0.04	0.06	26.7	1.18	214.0	3	11.2	1.01	134
STM088	28693	0.	0.	423.	0.	32.	54.	A	4.	13.	1.51	0.04	0.17	19.5	0.86	144.2	999	9.0	0.81	121
PFDSTM	28693	0.	0.	386.	0.	9.	15.		4.	4.	1.92	0.04	0.06	27.9	1.23	223.2	0	11.4	1.02	133
PFDSTM	28693	0.	0.	503.	0.	78.	127.		4.	32.	2.65	0.04	0.29	35.0	1.54	219.5	12	9.7	0.87	106
TISTMT	28693	0.	385.	0.	0.	-377.	400.		4.	4.	1.21	0.04	0.03	25.0	1.10	200.2	0	15.0	1.35	144
TISTMT	28693	0.	530.	0.	0.	-435.	687.		4.	39.	2.71	0.04	0.32	81.2	3.57	485.3	0	20.3	1.83	117
TISTMT	28693	0.	0.	385.	0.	9.	15.		4.	4.	2.09	0.04	0.06	36.9	1.62	295.0	0	12.5	1.12	129
TISTMT	28693	0.	0.	547.	0.	105.	175.		4.	43.	3.82	0.04	0.34	109.0	4.80	631.8	0	17.6	1.58	109
TIHRSG	28693	0.	392.	0.	0.	-383.	400.		4.	4.	1.22	0.04	0.04	27.6	1.21	217.4	0	15.4	1.38	140
TIHRSG	28693	0.	488.	0.	0.	-438.	536.		4.	20.	2.36	0.04	0.17	72.9	3.21	470.5	0	21.1	1.89	109
TIHRSG	28693	0.	0.	392.	0.	9.	9.		4.	4.	2.21	0.04	0.04	43.7	1.93	345.0	0	13.5	1.21	126
TIHRSG	28693	0.	0.	501.	0.	55.	53.		4.	22.	3.40	0.04	0.18	98.7	4.35	621.7	0	19.0	1.71	100
STIRL	28693	392.	0.	0.	-392.	9.	400.		4.	4.	0.99	0.04	0.04	18.2	0.80	143.0	-59	16.7	1.50	154
STIRL	28693	660.	0.	0.	-660.	120.	771.		4.	49.	1.59	0.04	0.26	37.2	1.64	181.2	0	20.5	1.85	122
STIRL	28693	0.	392.	0.	0.	-383.	400.		4.	4.	0.99	0.04	0.04	18.2	0.80	143.1	-36	14.2	1.27	148
STIRL	28693	0.	660.	0.	0.	-541.	771.		4.	49.	1.59	0.04	0.26	37.3	1.64	181.4	0	16.3	1.46	113
STIRL	28693	0.	0.	392.	0.	9.	8.		4.	4.	1.82	0.04	0.04	28.8	1.27	226.7	0	11.4	1.03	130
STIRL	28693	0.	0.	692.	0.	133.	123.		4.	54.	2.92	0.04	0.27	68.8	3.03	320.3	2	12.5	1.13	94
HEGT85	28693	0.	0.	404.	0.	9.	-3.	A	4.	4.	1.82	0.04	0.01	32.6	1.43	250.1	0	12.1	1.09	125
HEGT85	28693	0.	0.	2919.	0.	683.	-262.	A	4.	279.	10.24	0.04	0.13	269.1	11.85	310.3	0	37.9	3.41	121
HEGT60	28693	0.	0.	402.	0.	9.	-2.	A	4.	4.	1.82	0.04	0.02	32.3	1.42	248.5	0	12.0	1.08	126
HEGT60	28693	0.	0.	1163.	0.	224.	-42.	A	4.	91.	4.69	0.04	0.14	121.0	5.33	343.0	0	21.2	1.90	90
HEGT00	28693	0.	0.	400.	0.	9.	-0.	A	4.	4.	1.83	0.04	0.02	31.9	1.40	246.2	0	12.0	1.08	127
HEGT00	28693	0.	0.	675.	0.	91.	-1.	A	4.	37.	2.78	0.04	0.12	66.3	2.92	315.9	0	15.1	1.36	83
FCMCCL	28693	0.	0.	430.	0.	9.	-30.		4.	4.	1.94	0.04	-0.05	34.3	1.51	272.3	0	12.9	1.16	118
FCMCCL	28693	0.	0.	739.	0.	162.	172.		4.	66.	4.28	0.04	0.31	79.4	3.49	366.3	0	14.1	1.26	101
FCSTCL	28693	0.	0.	429.	0.	9.	-29.		4.	4.	1.97	0.04	-0.05	33.7	1.48	268.3	0	12.9	1.16	119
FCSTCL	28693	0.	0.	869.	0.	235.	289.		4.	96.	5.13	0.04	0.38	94.2	4.15	369.8	2	13.2	1.19	105
IGGTST	28693	0.	0.	433.	0.	9.	-33.		4.	4.	1.96	0.04	-0.06	32.8	1.44	258.0	0	12.8	1.15	118
IGGTST	28693	0.	0.	810.	0.	162.	102.		4.	66.	2.64	0.04	0.25	72.7	3.20	306.1	2	12.8	1.15	91
GTSOAR	28693	0.	392.	0.	0.	-383.	400.		4.	4.	0.93	0.04	0.04	17.3	0.76	136.5	-31	14.0	1.28	149
GTSOAR	28693	0.	743.	0.	0.	-588.	889.		4.	63.	1.30	0.04	0.29	28.5	1.25	123.9	0	14.8	1.33	119

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC08	28693	0.	389.	0.	0.	-380.	400.	4.	4.	0.92	0.04	0.05	16.8	0.74	133.8	-28	13.9	1.25	150
GTAC08	28693	0.	612.	0.	0.	-493.	768.	4.	48.	1.13	0.04	0.31	22.5	0.99	117.7	118	12.9	1.16	123
GTAC12	28693	0.	389.	0.	0.	-380.	400.	4.	4.	0.92	0.04	0.05	16.8	0.74	133.4	-28	13.9	1.25	150
GTAC12	28693	0.	679.	0.	0.	-530.	869.	4.	61.	1.24	0.04	0.33	26.5	1.17	125.6	0	13.1	1.18	122
GTAC16	28693	0.	389.	0.	0.	-380.	400.	4.	4.	0.92	0.04	0.05	16.9	0.74	134.2	-29	13.9	1.25	150
GTAC16	28693	0.	728.	0.	0.	-559.	937.	4.	69.	1.34	0.04	0.34	30.1	1.32	133.3	0	13.5	1.22	121
GTWC16	28693	0.	391.	0.	0.	-382.	400.	4.	4.	0.93	0.04	0.04	17.2	0.76	135.7	-30	14.0	1.26	149
GTWC16	28693	0.	778.	0.	0.	-602.	961.	4.	72.	1.33	0.04	0.32	29.1	1.28	121.0	0	14.3	1.29	121
CC1626	28693	0.	391.	0.	0.	-383.	400.	4.	4.	0.99	0.04	0.04	16.9	0.75	133.7	-32	14.1	1.27	150
CC1626	28693	0.	1000.	0.	0.	-732.	1266.	4.	109.	1.72	0.04	0.35	37.5	1.65	123.1	0	15.3	1.37	121
CC1622	28693	0.	390.	0.	0.	-382.	400.	4.	4.	0.98	0.04	0.05	16.7	0.74	132.3	-30	14.0	1.26	150
CC1622	28693	0.	912.	0.	0.	-671.	1176.	4.	98.	1.68	0.04	0.36	37.4	1.65	134.0	0	14.7	1.32	121
CC1222	28693	0.	390.	0.	0.	-381.	400.	4.	4.	0.98	0.04	0.05	16.6	0.73	131.2	-30	14.0	1.26	151
CC1222	28693	0.	904.	0.	0.	-665.	1171.	4.	97.	1.65	0.04	0.36	35.5	1.56	126.3	0	14.3	1.29	122
CC0822	28693	0.	389.	0.	0.	-380.	400.	4.	4.	0.99	0.04	0.05	16.8	0.74	133.1	-30	14.0	1.26	151
CC0822	28693	0.	764.	0.	0.	-575.	1004.	4.	77.	1.47	0.04	0.36	29.7	1.31	126.1	0	13.2	1.19	123
STIG15	28693	0.	402.	0.	0.	-394.	400.	4.	4.	0.94	0.04	0.02	16.9	0.74	130.1	-32	14.3	1.29	147
STIG15	28693	0.	24231.	0.	0.	-17595.	22585.	4.	2706.	39.86	0.04	0.17	671.0	29.53	94.3	0	314.1	28.24	744
STIG10	28693	0.	399.	0.	0.	-391.	400.	4.	4.	0.93	0.04	0.02	16.7	0.74	129.4	-30	14.2	1.27	148
STIG10	28693	0.	2377.	0.	0.	-1764.	2425.	4.	250.	4.04	0.04	0.22	75.9	3.34	107.0	0	35.4	3.18	138
STIG1S	28693	0.	398.	0.	0.	-389.	400.	4.	4.	0.93	0.04	0.03	16.6	0.73	129.3	-30	14.1	1.27	148
STIG1S	28693	0.	1494.	0.	0.	-1134.	1576.	4.	147.	2.73	0.04	0.23	47.1	2.07	104.6	0	24.5	2.20	122
DEADV3	28693	0.	396.	0.	0.	-387.	400.	4.	4.	1.02	0.04	0.03	20.1	0.88	156.7	-57	14.5	1.30	145
DEADV3	28693	0.	1537.	0.	0.	-1127.	1742.	4.	167.	3.62	0.04	0.29	111.5	4.91	241.2	0	29.7	2.67	129
DEHTPM	28693	0.	389.	0.	0.	-380.	400.	4.	4.	1.06	0.04	0.05	20.2	0.89	160.5	-58	14.4	1.29	146
DEHTPM	28693	0.	735.	0.	0.	-562.	949.	4.	70.	2.18	0.04	0.34	56.8	2.50	249.5	0	17.1	1.54	117
DESOA3	28693	398.	0.	0.	-398.	9.	400.	4.	4.	1.00	0.04	0.03	19.1	0.84	148.2	-73	17.0	1.53	151
DESOA3	28693	1842.	0.	0.	-1842.	478.	1971.	4.	195.	4.87	0.04	0.25	159.8	7.04	289.6	0	51.7	4.65	170
DESOA3	28693	0.	398.	0.	0.	-389.	400.	4.	4.	1.00	0.04	0.03	19.1	0.84	148.2	-45	14.4	1.30	146
DESOA3	28693	0.	1842.	0.	0.	-1364.	1971.	4.	195.	4.87	0.04	0.25	159.8	7.04	289.6	0	39.8	3.58	143
GTSOAD	28693	390.	0.	0.	-390.	9.	400.	4.	4.	0.92	0.04	0.05	16.7	0.73	131.9	-46	16.4	1.48	156
GTSOAD	28693	684.	0.	0.	-684.	144.	851.	4.	59.	1.17	0.04	0.31	23.6	1.04	111.0	0	17.7	1.59	133
GTRA08	28693	391.	0.	0.	-391.	9.	400.	4.	4.	0.93	0.04	0.04	17.4	0.77	137.6	-52	16.6	1.49	155
GTRA08	28693	937.	0.	0.	-937.	240.	1175.	4.	98.	1.64	0.04	0.34	40.7	1.79	141.8	0	21.7	1.95	133
GTRA12	28693	391.	0.	0.	-391.	9.	400.	4.	4.	0.92	0.04	0.04	17.4	0.76	137.2	-51	16.5	1.49	155
GTRA12	28693	910.	0.	0.	-910.	234.	1154.	4.	95.	1.59	0.04	0.34	38.8	1.71	139.3	0	21.0	1.89	133
GTRA16	28693	391.	0.	0.	-391.	9.	400.	4.	4.	0.93	0.04	0.04	17.6	0.77	138.7	-52	16.6	1.49	155
GTRA16	28693	869.	0.	0.	-869.	218.	1101.	4.	89.	1.59	0.04	0.34	39.0	1.72	146.1	0	20.8	1.87	132
GTR208	28693	391.	0.	0.	-391.	9.	400.	4.	4.	0.92	0.04	0.04	17.2	0.76	135.7	-50	16.5	1.48	155
GTR208	28693	783.	0.	0.	-783.	180.	974.	4.	73.	1.37	0.04	0.32	30.8	1.35	127.3	0	19.5	1.75	132
GTR212	28693	391.	0.	0.	-391.	9.	400.	4.	4.	0.93	0.04	0.04	17.3	0.76	136.5	-50	16.5	1.49	155
GTR212	28693	815.	0.	0.	-815.	193.	1018.	4.	79.	1.43	0.04	0.33	33.1	1.46	131.8	0	19.9	1.79	132
GTR216	28693	391.	0.	0.	-391.	9.	400.	4.	4.	0.93	0.04	0.05	17.4	0.76	137.2	-51	16.5	1.49	155
GTR216	28693	818.	0.	0.	-818.	19[illegible].	1034.	4.	81.	1.49	0.04	0.34	35.3	1.55	140.2	0	20.0	1.79	132

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTRW08	28693	394.	0.	0.	-394.	9.	400.	4.	4.	0.93	0.04	0.04	17.5	0.77	137.3	-53	16.7	1.50	154
GTRW08	28693	1136.	0.	0.	-1136.	287.	1330.	4.	117.	1.67	0.04	0.30	40.5	1.78	117.3	0	25.3	2.27	136
GTRW12	28693	393.	0.	0.	-393.	9.	400.	4.	4.	0.93	0.04	0.04	17.5	0.77	137.6	-53	16.6	1.50	154
GTRW12	28693	1111.	0.	0.	-1111.	291.	1344.	4.	119.	1.68	0.04	0.32	40.7	1.79	120.6	0	24.1	2.17	136
GTRW16	28693	393.	0.	0.	-393.	9.	400.	4.	4.	0.93	0.04	0.04	17.7	0.78	138.9	-54	16.6	1.50	154
GTRW16	28693	1048.	0.	0.	-1048.	269.	1271.	4.	110.	1.65	0.04	0.32	40.2	1.77	126.1	0	23.5	2.11	135
GTR308	28693	395.	0.	0.	-395.	9.	400.	4.	4.	0.93	0.04	0.03	17.2	0.76	134.7	-51	16.7	1.50	154
GTR308	28693	982.	0.	0.	-982.	219.	1103.	4.	89.	1.46	0.04	0.26	33.6	1.48	112.2	0	24.0	2.16	132
GTR312	28693	392.	0.	0.	-392.	9.	400.	4.	4.	0.93	0.04	0.04	17.3	0.76	136.3	-51	16.6	1.49	155
GTR312	28693	950.	0.	0.	-950.	234.	1153.	4.	95.	1.49	0.04	0.31	34.4	1.51	118.4	0	21.9	1.97	134
GTR316	28693	393.	0.	0.	-393.	9.	400.	4.	4.	0.93	0.04	0.04	17.5	0.77	137.5	-52	16.6	1.49	154
GTR316	28693	944.	0.	0.	-944.	230.	1141.	4.	94.	1.51	0.04	0.31	35.4	1.56	122.6	0	22.0	1.98	133
FCPADS	28693	396.	0.	0.	-396.	9.	400.	4.	4.	1.20	0.04	0.03	18.4	0.81	143.2	-65	17.1	1.54	153
FCPADS	28693	1853.	0.	0.	-1853.	506.	2065.	4.	206.	21.59	0.04	0.28	121.2	5.33	218.4	0	62.7	5.64	201
FCMCDS	28693	392.	0.	0.	-392.	9.	400.	4.	4.	1.17	0.04	0.04	18.5	0.81	145.8	-65	16.9	1.52	154
FCMCDS	28693	1352.	0.	0.	-1352.	400.	1711.	4.	163.	16.25	0.04	0.36	104.5	4.60	256.0	0	45.8	4.12	175

REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----------FUEL USE IN BTU*10**6----------																			
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28694	0.	8.	427.	0.	0.	0.	F	3.	0.	1.50	0.03	0.	24.8	1.00	179.9	0	11.9	1.00	80
STM141	28694	0.	413.	0.	0.	-405.	427.		3.	3.	1.03	0.03	0.05	14.7	0.59	103.7	-20	14.5	1.22	156
STM141	28694	0.	446.	0.	0.	-418.	495.		3.	12.	0.86	0.03	0.15	15.0	0.61	99.3	-17	13.8	1.16	137
STM141	28694	0.	0.	413.	0.	8.	14.	F	3.	3.	2.11	0.03	0.05	31.6	1.27	222.6	0	12.4	1.06	132
STM141	28694	0.	0.	446.	0.	28.	48.	F	3.	12.	1.78	0.03	0.15	29.1	1.17	191.9	18	10.9	0.92	114
STM141	28694	0.	0.	413.	0.	8.	14.	A	3.	3.	2.01	0.03	0.05	28.8	1.16	203.0	1	12.0	1.01	133
STM141	28694	0.	0.	446.	0.	28.	48.	A	3.	12.	1.59	0.03	0.15	20.3	0.82	133.8	999	9.7	0.82	120
PFBSTM	28694	0.	0.	414.	0.	8.	13.		3.	3.	2.07	0.03	0.05	30.2	1.22	212.4	0	12.2	1.03	132
PFBSTM	28694	0.	0.	512.	0.	63.	100.		3.	26.	2.76	0.03	0.24	35.3	1.42	207.1	10	11.0	0.93	104
TISTMT	28694	0.	414.	0.	0.	-406.	427.		3.	3.	1.28	0.03	0.05	26.8	1.08	188.6	0	16.1	1.35	143
TISTMT	28694	0.	531.	0.	0.	-454.	659.		3.	32.	2.73	0.03	0.28	80.8	3.26	458.6	0	21.6	1.82	113
TISTMT	28694	0.	0.	414.	0.	8.	13.		3.	3.	2.23	0.03	0.05	39.9	1.61	280.8	0	13.4	1.13	128
TISTMT	28694	0.	0.	554.	0.	91.	150.		3.	37.	3.95	0.03	0.30	112.6	4.54	615.2	0	19.2	1.62	106
TIHRSG	28694	0.	423.	0.	0.	-414.	427.		3.	3.	1.30	0.03	0.03	30.3	1.22	209.8	0	16.6	1.40	139
TIHRSG	28694	0.	557.	0.	0.	-501.	589.		3.	23.	2.61	0.03	0.14	81.1	3.27	440.7	0	23.6	1.99	103
TIHRSG	28694	0.	0.	423.	0.	8.	5.		3.	3.	2.29	0.03	0.03	44.4	1.79	307.3	0	14.1	1.19	125
TIHRSG	28694	0.	0.	585.	0.	66.	37.		3.	27.	3.89	0.03	0.15	113.8	4.59	592.3	0	21.6	1.82	94
STIRL	28694	420.	0.	0.	-420.	8.	427.		3.	3.	1.04	0.03	0.03	19.5	0.79	135.8	-56	17.9	1.51	153
STIRL	28694	678.	0.	0.	-678.	111.	771.		3.	45.	1.66	0.03	0.23	38.9	1.57	177.1	0	22.0	1.86	120
STIRL	28694	0.	420.	0.	0.	-412.	427.		3.	3.	1.04	0.03	0.03	19.5	0.79	135.8	-35	15.2	1.28	148
STIRL	28694	0.	678.	0.	0.	-567.	771.		3.	45.	1.66	0.03	0.23	38.9	1.57	177.3	0	17.6	1.49	111
STIRL	28694	0.	0.	420.	0.	8.	7.		3.	3.	1.94	0.03	0.03	31.2	1.26	216.6	0	12.2	1.03	130
STIRL	28694	0.	0.	727.	0.	130.	109.		3.	53.	3.09	0.03	0.25	73.5	2.96	314.4	0	13.9	1.17	93
HEG160	28694	0.	0.	434.	0.	8.	-7.	A	3.	3.	1.91	0.03	0.00	33.6	1.35	227.3	0	12.8	1.08	126
HEGT60	28694	0.	0.	2063.	0.	397.	-333.	A	3.	162.	7.19	0.03	0.03	181.3	7.31	290.0	0	32.3	2.72	96
HEGT00	28694	0.	0.	429.	0.	8.	-2.	A	3.	3.	1.92	0.03	0.01	33.2	1.34	226.6	0	12.7	1.07	127
HEG100	28694	0.	0.	783.	0.	108.	-22.	A	3.	44.	3.15	0.03	0.10	75.1	3.03	300.2	0	16.9	1.43	81
FCMCCL	28694	0.	0.	487.	0.	8.	-60.		3.	3.	2.04	0.03	-0.12	36.3	1.46	254.2	0	14.2	1.20	111
FCMCCL	28694	0.	0.	849.	0.	186.	172.		3.	76.	4.78	0.03	0.30	87.8	3.54	362.7	0	15.5	1.30	100
FCSTCL	28694	0.	0.	487.	0.	8.	-59.		3.	3.	2.09	0.03	-0.12	36.0	1.45	252.4	0	14.2	1.20	111
FCSTCL	28694	0.	0.	925.	0.	231.	247.		3.	94.	5.35	0.03	0.34	97.0	3.91	357.5	1	15.0	1.26	103
IGGTST	28694	0.	0.	491.	0.	8.	-64.		3.	3.	2.07	0.03	-0.13	35.0	1.41	242.9	0	14.1	1.19	111
IGGTST	28694	0.	0.	861.	0.	152.	47.		3.	62.	2.69	0.03	0.19	74.2	2.99	294.2	0	14.6	1.23	87
GTSOAR	28694	0.	421.	0.	0.	-413.	427.		3.	3.	0.97	0.03	0.03	18.3	0.74	127.1	-29	15.0	1.26	149
GTSOAR	28694	0.	865.	0.	0.	-685.	1004.		3.	74.	1.51	0.03	0.27	34.5	1.39	125.7	0	17.2	1.45	117
GTAC08	28694	0.	416.	0.	0.	-408.	427.		3.	3.	0.96	0.03	0.04	17.9	0.72	125.3	-27	14.8	1.25	150
GTAC08	28694	0.	659.	0.	0.	-531.	628.		3.	52.	1.22	0.03	0.31	24.5	0.99	114.7	108	13.8	1.17	124
GTAC12	28694	0.	417.	0.	0.	-409.	427.		3.	3.	0.95	0.03	0.04	17.8	0.72	124.8	-27	14.8	1.25	150
GTAC12	28694	0.	735.	0.	0.	-574.	939.		3.	66.	1.34	0.03	0.32	28.8	1.16	122.2	0	14.1	1.19	123
GTAC16	28694	0.	418.	0.	0.	-409.	427.		3.	3.	0.95	0.03	0.04	17.9	0.72	125.4	-27	14.8	1.25	150
GTAC16	28694	0.	804.	0.	0.	-617.	1025.		3.	76.	1.46	0.03	0.34	33.0	1.33	128.9	0	14.8	1.25	121
GTWC16	28694	0.	419.	0.	0.	-411.	427.		3.	3.	0.96	0.03	0.04	18.2	0.73	126.9	-28	14.9	1.26	149
GTWC16	28694	0.	839.	0.	0.	-649.	1036.		3.	77.	1.43	0.03	0.32	31.4	1.26	117.7	0	15.3	1.29	121

		----------FUEL USE IN BTU*10**6----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN,	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
DEHTPM	28694	0.	419.	0.	0.	-411.	427.	3.	3.	1.12	0.03	0.04	21.8	0.88	151.8	-54	15.5	1.30	146
DEHTPM	28694	0.	792.	0.	0.	-629.	946.	3.	66.	2.36	0.03	0.29	62.3	2.51	246.6	0	20.2	1.70	114
GTSOAD	28694	418.	0.	0.	-418.	8.	427.	3.	3.	0.95	0.03	0.04	17.7	0.71	123.6	-43	17.5	1.48	156
GTSOAD	28694	749.	0.	0.	-749.	157.	926	3.	64.	1.27	0.03	0.31	25.9	1.04	107.8	0	19.3	1.63	133
GTRA08	28694	421.	0.	0.	-421.	8.	427.	3.	3.	0.96	0.03	0.03	18.4	0.74	128.0	-48	17.7	1.50	154
GTRA08	28694	1170.	0.	0.	-1170.	[illegible]	1405.	3.	122.	1.89	0.03	0.31	47.9	1.93	131.6	0	26.4	2.23	135
GTRA12	28694	420.	0.	0.	-420.	8.	427.	3.	3.	0.96	0.03	0.03	18.3	0.74	127.5	-47	17.7	1.49	155
GTRA12	28694	1103.	0.	0.	-1103.	284.	1351.	3.	116.	1.87	0.03	0.32	47.4	1.91	137.8	0	25.2	2.13	134
GTRA16	28694	420.	0.	0.	-420.	8.	427.	3.	3.	0.97	0.03	0.04	18.5	0.75	128.6	-48	17.7	1.49	155
GTRA16	28694	1031.	0.	0.	-1031.	259.	1266.	3.	105.	1.85	0.03	0.32	46.9	1.89	145.2	0	24.5	2.06	133
GTR208	28694	420.	0.	0.	-420.	8.	427.	3.	3.	0.96	0.03	0.04	18.2	0.73	126.5	-46	17.7	1.49	155
GTR208	28694	899.	0.	0.	-899.	207.	1093.	3.	84.	1.57	0.03	0.31	36.8	1.48	129.4	0	22.4	1.89	131
GTR212	28694	420.	0.	0.	-420.	8.	427.	3.	3.	0.96	0.03	0.04	18.3	0.74	127.2	-46	17.7	1.49	155
GTR212	28694	936.	0.	0.	-936.	222.	1143.	3.	91.	1.64	0.03	0.31	39.4	1.59	133.4	0	22.9	1.93	132
GTR216	28694	419.	0.	0.	-419.	8.	427.	3.	3.	0.96	0.03	0.04	18.3	0.74	127.7	-47	17.7	1.49	155
GTR216	28694	944.	0.	0.	-944.	229.	1166.	3.	93.	1.71	0.03	0.32	42.0	1.69	141.3	0	23.0	1.94	132
GTRW08	28694	423.	0.	0.	-423.	8.	427.	3.	3.	0.97	0.03	0.03	18.5	0.74	127.7	-48	17.8	1.50	154
GTRW08	28694	1394.	0.	0.	-1394.	352.	1578.	3.	143.	1.96	0.03	0.28	49.3	1.99	114.8	0	30.7	2.59	139
GTRW12	28694	422.	0.	0.	-422.	8.	427.	3.	3.	0.96	0.03	0.03	18.5	0.74	128.1	-48	17.8	1.50	154
GTRW12	28694	1328.	0.	0.	-1328.	347.	1563.	3.	142.	1.94	0.03	0.30	48.8	1.97	119.0	0	28.6	2.41	138
GTRW16	28694	421.	0.	0.	-421.	8.	427.	3.	3.	0.97	0.03	0.03	18.6	0.75	129.2	-49	17.8	1.50	154
GTRW16	28694	1221.	0.	0.	-1221.	313.	1449.	3.	128.	1.89	0.03	0.31	47.5	1.91	125.5	0	27.2	2.30	136
GTR308	28694	424.	0.	0.	-424.	8.	427.	3.	3.	0.96	0.03	0.03	18.2	0.73	125.6	-47	17.8	1.50	154
GTR308	28694	1179.	0.	0.	-1179.	263.	1279.	3.	107.	1.67	0.03	0.24	38.6	1.56	105.6	0	28.3	2.39	134
GTR312	28694	421.	0.	0.	-421.	8.	427.	3.	3.	0.96	0.03	0.03	18.3	0.74	127.2	-47	17.7	1.49	155
GTR312	28694	1065.	0.	0.	-1065.	262.	1277.	3.	107.	1.68	0.03	0.31	[illegible]	1.62	120.5	0	24.6	2.07	134
GTR316	28694	421.	0.	0.	-421.	8.	427.	3.	3.	0.97	0.03	0.03	18.5	0.74	128.3	-48	17.7	1.50	154
GTR316	28694	1056.	0.	0.	-1056.	257.	1262.	3.	105.	1.71	0.03	0.30	41.1	1.66	124.6	0	24.7	2.08	133
FCPADS	28694	424.	0.	0.	-424.	8.	427.	3.	3.	1.21	0.03	0.03	19.6	0.79	135.1	-59	18.2	1.54	153
FCPADS	28694	2000.	0.	0.	-2000.	546.	2229.	3.	223.	23.32	0.03	0.28	131.4	5.29	216.5	0	67.6	5.70	203
FCMCDS	28694	420.	0.	0.	-420.	8.	427.	3.	3.	1.19	0.03	0.04	19.7	0.79	137.2	-59	18.1	1.52	154
FCMCDS	28694	1459.	0.	0.	-1459.	432.	1847.	3.	176.	17.56	0.03	0.36	113.4	4.57	252.9	0	49.4	4.16	176

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28731	0.	9.	782.	0.	0.	0.	F	4.	0.	2.22	0.02	0.	42.0	1.00	190.5	0	21.3	1.00	80
PFBSTM	28731	0.	0.	770.	0.	9.	12.		4.	4.	2.77	0.02	0.03	40.2	0.96	178.3	999	20.8	0.98	134
PFBSTM	28731	0.	0.	860.	0.	55	76.		4.	22.	3.72	0.02	0.13	42.3	1.01	168.1	178	19.9	0.94	102
TIHRSG	28731	0.	784.	0.	0.	-775.	782.		4.	4.	1.49	0.02	0.01	34.9	0.83	151.8	-53	29.1	1.37	145
TIHRSG	28731	0.	1177.	0.	0.	-1058.	1152.		4.	49.	3.96	0.02	0.07	138.6	3.30	401.6	0	45.8	2.16	94
TIHRSG	28731	0.	0.	784.	0.	9.	-2.		4.	4	3.03	0.02	0.01	61.6	1.46	268.1	0	23.6	1.11	125
TIHRSG	28731	0.	0.	1177.	0.	119.	-26.		4.	49.	5.95	0.02	0.07	176.4	4.20	511.1	0	37.2	1.75	81
HEGT00	28731	0	0.	785.	0.	9.	-3.	A	4.	4.	2.64	0.02	0.01	49.7	1.18	215.9	0	21.9	1.03	128
HEGT00	28731	0.	0.	1434.	0.	181.	-74.	A	4.	74.	4.71	0.02	0.07	108.4	2.58	258.1	0	28.2	1.33	77
FCMCCL	28731	0.	0.	771.	0.	9.	11.		4.	4.	2.83	0.02	0.02	55.5	1.32	245.8	0	22.7	1.07	128
FCMCCL	28731	0.	0.	1371.	0.	300.	385.		4.	122.	7.25	0.02	0.33	124.5	2.96	309.8	4	22.4	1.05	101
GTSOAR	28731	0.	778.	0.	0.	-769.	782.		4.	4.	1.25	0.02	0.02	[illegible]	0.64	117.5	-27	27.8	1.31	152
GTSOAR	28731	0.	1893.	0.	0.	-1498.	2074.		4.	161.	2.18	0.02	0.23	63.6	1.51	114.7	0	36.2	1.70	117
GTAC08	28731	0.	771.	0.	0.	-762.	782.		4.	4.	1.24	0.02	0.03	26.3	0.63	116.5	-26	27.6	1.30	153
GTAC08	28731	0.	1249.	0.	0.	-1006.	1564.		4.	99.	1.47	0.02	0.31	38.4	0.91	104.9	-47	25.2	1.19	126
GTAC12	28731	0.	770.	0.	0.	-762.	782.		4.	4.	1.23	0.02	0.03	26.3	0.62	116.3	-26	27.5	1.30	153
GTAC12	28731	0.	1362.	0.	0.	-1063.	1753.		4.	122.	1.66	0.02	0.34	45.5	1.08	114.1	0	25.2	1.18	125
GTAC16	28731	0.	772.	0.	0.	-763.	782.		4.	4.	1.23	0.02	0.02	26.4	0.63	116.5	-26	27.6	1.30	153
GTAC16	28731	0.	1542.	0.	0.	-1184.	1951.		4.	146.	1.99	0.02	0.33	57.6	1.37	127.5	0	27.6	1.30	121
GTWC16	28731	0.	773.	0.	0.	-764.	782.		4.	4.	1.24	0.02	0.02	26.6	0.63	117.6	-27	27.7	1.30	153
GTWC16	28731	0.	1576.	0.	0.	-1219.	1948.		4.	146.	1.77	0.02	0.32	48.6	1.16	105.1	0	27.5	1.29	123
GTSOAD	28731	772.	0.	0.	-772.	9.	782.		4.	4.	1.23	0.02	0.02	26.1	0.62	115.4	-41	32.9	1.55	159
GTSOAD	28731	1407.	0.	0.	-1407.	295.	1741.		4.	120.	1.61	0.02	0.31	43.3	1.03	105.1	0	36.2	1.70	136
GTRA08	28731	778.	0.	0.	-778.	9.	782.		4.	4.	1.24	0.02	0.01	26.8	0.64	117.5	-43	33.2	1.56	158
GTRA08	28731	3161.	0.	0.	-3161.	811.	3468.		4.	331.	3.58	0.02	0.26	114.8	2.73	123.9	0	70.6	3.32	150
GTRA12	28731	777.	0.	0.	-777.	9.	782.		4.	4.	1.24	0.02	0.02	26.8	0.64	117.5	-43	33.2	1.56	158
GTRA12	28731	2710.	0.	0.	-2710.	697.	3087.		4.	284.	3.29	0.02	0.28	104.7	2.49	131.8	0,	61.4	2.89	143
GTRA16	28731	776.	0.	0.	-776.	9.	782.		4.	4.	1.24	0.02	0.02	27.0	0.64	118.5	-43	33.2	1.56	158
GTRA16	28731	2374.	0.	0.	-2374.	596.	2747.		4.	243.	2.97	0.02	0.29	93.3	2.22	134.0	0	55.3	2.60	139
GTR208	28731	775.	0.	0.	-775.	9.	782.		4.	4.	1.24	0.02	0.02	26.6	0.63	117.2	-42	33.1	1.56	158
GTR208	28731	1893.	0.	0.	-1893.	435.	2211.		4.	178.	2.26	0.02	0.28	66.8	1.59	120.5	0	46.5	2.19	134
GTR212	28731	775.	0.	0.	-775.	9.	782.		4.	4.	1.24	0.02	0.02	26.7	0.64	117.7	-42	33.1	1.56	158
GTR212	28731	1983.	0.	0.	-1983.	470.	2327.		4.	192.	2.41	0.02	0.29	72.4	1.72	124.7	0	47.8	2.25	135
GTR216	28731	775.	0.	0.	-775.	9.	782.		4.	4.	1.24	0.02	0.02	26.8	0.64	118.0	-42	33.1	1.56	158
GTR216	28731	2021.	0.	0.	-2021.	489.	2392.		4.	200.	2.57	0.02	0.30	78.6	1.87	132.7	0	48.5	2.28	135
GTRW08	28731	780.	0.	0.	-780.	9.	782.		4.	4.	1.24	0.02	0.01	26.9	0.64	117.7	-43	33.3	1.57	158
GTRW08	28731	3559.	0.	0.	-3559.	898.	3759.		4.	366.	3.56	0.02	0.24	112.8	2.68	108.1	0	78.4	3.69	156
GTRW12	28731	778.	0.	0.	-778.	9.	782.		4.	4.	1.24	0.02	0.02	26.9	0.64	118.1	-43	33.2	1.56	158
GTRW12	28731	3124.	0.	0.	-3124.	817.	3489.		4.	333.	3.16	0.02	0.27	97.9	2.33	107.0	0	66.5	3.13	149
GTRW16	28731	777.	0.	0.	-777.	9.	782.		4.	4.	1.24	0.02	0.02	27.1	0.64	119.0	-44	33.2	1.56	158
GTRW16	28731	2680.	0.	0.	-2680.	688.	3055.		4.	280.	2.94	0.02	0.28	91.0	2.16	115.8	0	[illegible]	2.79	143
GTR308	28731	781.	0.	0.	-781.	9.	782.		4.	4.	1.24	0.02	0.01	26.6	0.63	116.3	-43	33.3	1.57	158
GTR308	28731	2651.	0.	0.	-2651.	591.	2730.		4.	241.	2.56	0.02	0.20	75.8	1.80	97.5	0	63.8	3.00	142

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTR312	28731	775.	0.	0.	-775.	9.	782.	4.	4.	1.24	0.02	0.02	26.8	0.64	117.8	-42	33.1	1.56	158
GTR312	28731	2123.	0.	0.	-2123.	522.	2500.	4.	213.	2.39	0.02	0.30	70.9	1.69	114.0	0	48.8	2.30	137
GTR316	28731	776.	0.	0.	-776.	9.	782.	4.	4.	1.24	0.02	0.02	26.9	0.64	118.6	-43	33.1	1.56	158
GTR316	28731	2095.	0.	0.	-2095.	510.	2462.	4.	208.	2.43	0.02	0.30	72.8	1.73	118.6	0	48.9	2.30	137
FCPADS	28731	778.	0.	0.	-778.	9.	782.	4.	4.	1.55	0.02	0.02	28.9	0.69	126.8	-50	33.7	1.59	157
FCPADS	28731	3765.	0.	0.	-3765.	1028.	4195.	4.	419.	45.41	0.02	0.28	237.6	5.65	215.4	0	130.9	6.16	214
FCMCDS	28731	774.	0.	0.	-774.	9.	782.	4.	4.	1.52	0.02	0.02	29.1	0.69	128.1	-50	33.6	1.58	157
FCMCDS	28731	2747.	0.	0.	-2747.	813.	3476.	4.	332.	33.97	0.02	0.36	204.4	4.86	253.9	0	94.8	4.46	183

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----FUEL USE IN BTU*10**6---- **COGENERATION CASE**			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	28741	0.	10.	141.	0.	0.	0.	A	4.	0.	0.66	0.15	0.	7.4	1.00	232.0	0	4.5	1.00	80
STM141	28741	0.	124.	0.	0.	-114.	141.		4.	4.	0.62	0.15	0.18	6.7	0.91	183.4	-38	4.9	1.10	157
STM141	28741	0.	136.	0.	0.	-119.	165.		4.	7.	0.49	0.15	0.25	6.6	0.89	165.3	-13	4.6	1.02	151
STM141	28741	0.	0.	124.	0.	10.	17.	F	4.	4.	1.11	0.15	0.18	13.7	1.86	376.4	2	4.7	1.04	139
STM141	28741	0.	0.	136.	0.	17.	29.	F	4.	7.	0.88	0.15	0.25	12.4	1.69	312.0	12	4.0	0.89	132
STM141	28741	0.	0.	124.	0.	10.	17.	A	4.	4.	1.03	0.15	0.18	12.3	1.67	336.6	6	4.4	0.99	140
STM141	28741	0.	0.	136.	0.	17.	29.	A	4.	7.	0.78	0.15	0.25	9.9	1.34	247.8	25	3.6	0.80	135
STM088	28741	0.	124.	0.	0.	-114.	141.		4.	4.	0.60	0.15	0.18	6.2	0.85	171.2	-23	4.8	1.08	158
STM088	28741	0.	129.	0.	0.	-116.	151.		4.	5.	0.46	0.15	0.21	5.8	0.79	153.1	-9	4.6	1.02	152
STM088	28741	0.	0.	124.	0.	10.	17.	F	4.	4.	1.07	0.15	0.18	13.0	1.77	356.9	4	4.6	1.02	139
STM088	28741	0.	0.	129.	0.	13.	22.	F	4.	5.	0.84	0.15	0.21	11.4	1.55	301.5	12	4.0	0.89	132
STM088	28741	0.	0.	124.	0.	10.	17.	A	4.	4.	1.00	0.15	0.18	11.4	1.55	313.4	8	4.3	0.96	141
STM088	28741	0.	0.	129.	0.	13.	22.	A	4.	5.	0.75	0.15	0.21	9.3	1.26	245.1	27	3.7	0.82	135
PFBSTM	28741	0.	0.	125.	0.	10.	16.		4.	4.	1.17	0.15	0.17	14.8	2.01	405.7	0	4.8	1.08	138
PFBSTM	28741	0.	0.	151.	0.	26.	43.		4.	10.	1.13	0.15	0.31	15.5	2.11	350.2	8	4.2	0.93	129
TISTMT	28741	0.	125.	0.	0.	-115.	141.		4.	4.	0.85	0.15	0.17	16.2	2.21	444.7	0	6.2	1.38	144
TISTMT	28741	0.	164.	0.	0.	-131.	220.		4.	14.	1.19	0.15	0.35	33.7	4.58	699.8	0	7.8	1.74	136
TISTMT	28741	0.	0.	125.	0.	10.	16.		4.	4.	1.37	0.15	0.17	24.3	3.30	665.2	0	6.1	1.36	137
TISTMT	28741	0.	0.	164.	0.	33.	56.		4.	14.	1.68	0.15	0.35	42.8	5.82	889.0	0	7.3	1.63	131
TIHRSG	28741	0.	131.	0.	0.	-121.	141.		4.	4.	0.94	0.15	0.13	23.0	3.12	597.7	0	7.1	1.59	138
TIHRSG	28741	0.	142.	0.	0.	-127.	156.		4.	6.	0.94	0.15	0.17	28.3	3.85	683.4	0	7.7	1.71	131
TIHRSG	28741	0.	0.	131.	0.	10.	10.		4.	4.	1.46	0.15	0.13	31.7	4.31	825.8	0	7.1	1.58	134
TIHRSG	28741	0.	0.	142.	0.	14.	15.		4.	6.	1.38	0.15	0.17	36.5	4.96	880.6	0	7.4	1.64	126
STIRL	28741	132.	0.	0.	-132.	10.	141.		4.	4.	0.57	0.15	0.13	6.7	0.91	173.8	-89	5.9	1.32	156
STIRL	28741	194.	0.	0.	-194.	36.	227.		4.	15.	0.59	0.15	0.26	10.9	1.49	192.3	0	6.7	1.49	136
STIRL	28741	0.	132.	0.	0.	-122.	141.		4.	4.	0.57	0.15	0.13	6.7	0.91	173.9	-42	5.1	1.13	151
STIRL	28741	0.	194.	0.	0.	-159.	227.		4.	15.	0.59	0.15	0.26	11.0	1.49	192.6	0	5.4	1.21	129
STIRL	28741	0.	0.	132.	0.	10.	9.		4.	4.	1.05	0.15	0.13	13.7	1.86	354.7	1	4.7	1.05	133
STIRL	28741	0.	0.	194.	0.	36.	33.		4.	15.	1.05	0.15	0.26	18.6	2.53	326.8	6	4.3	0.97	112
HEGT85	28741	0.	0.	144.	0.	10.	-3.	A	4.	4.	1.17	0.15	0.05	21.6	2.93	511.6	0	5.9	1.32	122
HEGT85	28741	0.	0.	668.	0.	154.	-44.	A	4.	63.	3.40	0.15	0.14	93.6	12.72	478.2	0	13.9	3.11	115
HEGT60	28741	0.	0.	142.	0.	10.	-1.	A	4.	4.	1.16	0.15	0.06	20.9	2.85	502.7	0	5.8	1.29	123
HEGT60	28741	0.	0.	304.	0.	57.	-6.	A	4.	23.	1.76	0.15	0.14	45.8	6.23	514.6	0	8.3	1.85	97
HEGT00	28741	0.	0.	141.	0.	10.	0.	A	4.	4.	1.13	0.15	0.07	19.9	2.70	480.8	0	5.6	1.26	124
HEGT00	28741	0.	0.	187.	0.	24.	0.	A	4.	10.	1.10	0.15	0.11	25.7	3.49	468.3	0	6.0	1.33	108
FCMCCL	28741	0.	0.	128.	0.	10.	13.		4.	4.	1.18	0.15	0.15	19.2	2.61	510.7	0	5.4	1.22	134
FCMCCL	28741	0.	0.	194.	0.	42.	56.		4.	17.	1.56	0.15	0.34	30.4	4.13	533.6	0	5.7	1.28	118
FCSTCL	28741	0.	0.	127.	0.	10.	14.		4.	4.	1.21	0.15	0.16	18.6	2.53	499.2	0	5.4	1.20	135
FCSTCL	28741	0.	0.	243.	0.	70.	99.		4.	28.	2.00	0.15	0.41	38.0	5.17	535.3	1	5.8	1.30	114
IGGTST	28741	0.	0.	132.	0.	10.	9.		4.	4.	1.22	0.15	0.13	18.8	2.56	488.4	0	5.5	1.23	132
IGGTST	28741	0.	0	226.	0.	49.	47.		4.	20.	1.34	0.15	0.30	31.2	4.23	470.0	0	5.6	1.26	108
GTSOAR	28741	0.	132	0.	0.	-122.	141.		4.	4.	0.54	0.15	0.13	6.9	0.94	180.1	-53	5.1	1.13	151
GTSOAR	28741	0.	215.	0.	0.	-170.	258.		4.	18.	0.54	0.15	0.29	10.7	1.46	170.6	0	5.2	1.17	126

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----------FUEL USE IN BTU*10**6----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTAC08	28741	0.	128.	0.	0.	-118.	141.	4.	4.	0.53	0.15	0.15	6.4	0.87	170.2	-25	4.9	[illegible].09	155
GTAC08	28741	0.	179.	0.	0.	-144.	224.	4.	14.	0.46	0.15	0.31	8.3	1.12	157.5	0	4.6	1.03	137
GTAC12	28741	0.	129.	0.	0.	-119.	141.	4.	4.	0.53	0.15	0.15	6.4	0.87	169.9	-25	4.9	1.09	155
GTAC12	28741	0.	198.	0.	0.	-155.	254.	4.	18.	0.50	0.15	0.33	9.5	1.29	164.2	0	4.7	1.05	132
GTAC16	28741	0.	129.	0.	0.	-119.	141.	4.	4.	0.53	0.15	0.15	6.5	0.89	173.1	-29	4.9	1.10	154
GTAC16	28741	0.	212.	0.	0.	-163.	273.	4.	20.	0.54	0.15	0.34	10.8	1.47	173.7	0	4.8	1.08	128
GTWC16	28741	0.	131.	0.	0.	-121.	141.	4.	4.	0.54	0.15	0.13	6.8	0.93	177.8	-43	5.0	1.12	152
GTWC16	28741	0.	227.	0.	0.	-176.	281.	4.	21.	0.55	0.15	0.32	11.2	1.52	167.5	0	5.2	1.15	124
CC1626	28741	0.	131.	0.	0.	-121.	141.	4.	4.	0.61	0.15	0.13	6.9	0.94	180.1	-73	5.1	1.14	152
CC1626	28741	0.	310.	0.	0.	-223.	400.	4.	36.	0.81	0.15	0.36	15.7	2.14	173.1	0	5.7	1.27	118
CC1622	28741	0.	130.	0.	0.	-120.	141.	4.	4.	0.60	0.15	0.14	6.7	0.91	175.0	-47	5.1	1.13	153
CC1622	28741	0.	283.	0.	0.	-204.	371.	4.	32.	0.77	0.15	0.37	14.8	2.01	178.8	0	5.4	1.20	119
CC1222	28741	0.	130.	0.	0.	-120.	141.	4.	4.	0.60	0.15	0.14	6.5	0.89	171.7	-39	5.0	1.12	154
CC1222	28741	0.	280.	0.	0.	-202.	370.	4.	32.	0.76	0.15	0.37	14.1	1.92	171.6	0	5.3	1.17	120
CC0822	28741	0.	128.	0.	0.	-119.	141.	4.	4.	0.61	0.15	0.15	6.7	0.91	178.1	-45	5.0	1.12	154
CC0822	28741	0.	237.	0.	0.	-174.	319.	4.	26.	0.69	0.15	0.38	12.2	1.66	175.9	0	4.9	1.09	124
STIG15	28741	0.	144.	0.	0.	-134.	141.	4.	4.	0.58	0.15	0.05	6.9	0.94	164.2	-77	5.4	1.21	143
STIG15	28741	0.	7077.	0.	0.	-5139.	6596.	4.	790.	12.38	0.15	0.17	206.7	28.09	99.7	0	94.1	21.01	563
STIG10	28741	0.	140.	0.	0.	-131.	141.	4.	4.	0.56	0.15	0.07	6.7	0.91	162.2	-52	5.3	1.18	146
STIG10	28741	0.	694.	0.	0.	-515.	708.	4.	73.	1.40	0.15	0.22	23.9	3.24	117.3	0	11.3	2.52	122
STIG1S	28741	0.	139.	0.	0.	-129.	141.	4.	4.	0.56	0.15	0.08	6.6	0.89	161.8	-46	5.2	1.17	147
STIG1S	28741	0.	436.	0.	0.	-331.	460.	4.	43.	1.00	0.15	0.23	16.2	2.20	126.8	0	8.2	1.82	113
DEADV3	28741	0.	136.	0.	0.	-126.	141.	4.	4.	0.62	0.15	0.10	8.8	1.19	220.3	0	5.4	1.22	144
DEADV3	28741	0.	437.	0.	0.	-321.	498.	4.	48.	1.23	0.15	0.29	32.4	4.40	252.7	0	9.3	2.07	116
DEHTPM	28741	0.	129.	0.	0.	-119.	141.	4.	4.	0.65	0.15	0.15	8.9	1.20	235.1	0	5.3	1.18	148
DEHTPM	28741	0.	214.	0.	0.	-163.	280.	4.	21.	0.79	0.15	0.35	16.6	2.26	264.7	0	5.6	1.26	123
DESOA3	28741	138.	0.	0.	-138.	10.	141.	4.	4.	0.60	0.15	0.08	7.8	1.07	193.7	0	6.3	1.40	149
DESOA3	28741	521.	0.	0.	-521.	135.	561.	4.	55.	1.60	0.15	0.25	46.0	6.26	301.4	0	15.5	3.46	142
DESOA3	28741	0.	138.	0.	0.	-128.	141.	4.	4.	0.60	0.15	0.08	7.8	1.07	193.7	0	5.4	1.20	144
DESOA3	28741	0.	521.	0.	0.	-386.	561.	4.	55.	1.60	0.15	0.25	46.0	6.26	301.4	0	12.1	2.70	123
GTSOAD	28741	130.	0.	0.	-130.	10.	141.	4.	4.	0.52	0.15	0.14	6.2	0.85	163.9	-53	5.7	1.28	159
GTSOAD	28741	199.	0.	0.	-199.	42.	248.	4.	17.	0.48	0.15	0.31	8.6	1.17	147.3	0	6.0	1.34	140
GTRA08	28741	131.	0.	0.	-131.	10.	141.	4.	4.	0.54	0.15	0.13	7.1	0.97	185.5	163	5.9	1.32	155
GTRA08	28741	269.	0.	0.	-269.	69.	340.	4.	28.	0.65	0.15	0.34	14.5	1.97	183.6	0	7.3	1.62	128
GTRA12	28741	131.	0.	0.	-131.	10.	141.	4.	4.	0.54	0.15	0.13	7.0	0.96	184.1	136	5.9	[illegible].31	156
GTRA12	28741	262.	0.	0.	-262.	67.	334.	4.	28.	0.65	0.15	0.35	14.5	1.97	188.4	0	7.1	1.59	128
GTRA16	28741	130.	0.	0.	-130.	10.	141.	4.	4.	0.55	0.15	0.14	7.2	0.98	189.4	999	5.9	1.32	155
GTRA16	28741	251.	0.	0.	-251.	63.	319.	4.	26.	0.65	0.15	0.34	14.6	1.98	198.4	0	7.1	1.58	129
GTR208	28741	131.	0.	0.	-131.	10.	141.	4.	4.	0.54	0.15	0.13	6.8	0.93	178.1	-94	5.9	1.31	157
GTR208	28741	227.	0.	0.	-227.	52.	283.	4.	21.	0.56	0.15	0.32	11.5	1.56	172.4	0	6.6	1.48	132
GTR212	28741	131.	0.	0.	-131.	10.	141.	4.	4.	0.54	0.15	0.13	6.9	0.94	181.2	113	5.9	1.31	156
GTR212	28741	236.	0.	0.	-236.	56.	296.	4.	23.	0.59	0.15	0.33	12.4	1.68	179.0	0	6.8	1.51	131
GTR216	28741	130.	0.	0.	-130.	10.	141.	4.	4.	0.54	0.15	0.14	7.0	0.95	18[illegible].9	129	5.9	1.31	156
GTR216	28741	237.	0.	0.	-237.	57.	300.	4.	23.	0.61	0.15	0.34	13.1	1.78	188.5	0	6.8	1.52	130

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTRW08	28741	134.	0.	0.	-134.	10.	141.	4.	4.	0.55	0.15	0.11	7.2	0.98	183.4	999	6.0	1.35	153
GTRW08	28741	327.	0.	0.	-327.	82.	384.	4.	34.	0.71	0.15	0.30	15.9	2.16	166.0	0	8.5	1.90	126
GTRW12	28741	133.	0.	0.	-133.	10.	141.	4.	4.	0.55	0.15	0.12	7.2	0.98	184.9	999	6.0	1.34	154
GTRW12	28741	321.	0.	0.	-321.	84.	389.	4.	34.	0.71	0.15	0.32	16.0	2.18	170.6	0	8.2	1.83	126
GTRW16	28741	133.	0.	0.	-133.	10.	141.	4.	4.	0.55	0.15	0.12	7.4	1.00	189.3	999	6.0	1.34	154
GTRW16	28741	303.	0.	0.	-303.	78.	369.	4.	32.	0.70	0.15	0.32	15.9	2.16	179.2	0	8.0	1.79	126
GTR308	28741	135.	0.	0.	-135.	10.	141.	4.	4.	0.54	0.15	0.10	6.9	0.94	173.5	116	6.0	1.35	153
GTR308	28741	283.	0.	0.	-283.	63.	319.	4.	26.	0.62	0.15	0.26	12.8	1.75	155.0	0	8.0	1.78	126
GTR312	28741	133.	0.	0.	-133.	10.	141.	4.	4.	0.54	0.15	0.12	7.0	0.95	179.9	127	5.9	1.33	155
GTR312	28741	276.	0.	0.	-276.	68.	335.	4.	28.	0.63	0.15	0.32	13.4	1.82	165.5	0	7.5	1.66	128
GTR316	28741	133.	0.	0.	-133.	10.	141.	4.	4.	0.55	0.15	0.12	7.2	0.97	184.3	183	6.0	1.33	154
GTR316	28741	274.	0.	0.	-274.	67.	332.	4.	27.	0.64	0.15	0.31	13.9	1.89	172.6	0	7.5	1.68	127
FCPADS	28741	137.	0.	0.	-137.	10.	141.	4.	4.	0.83	0.15	0.09	7.1	0.96	175.8	187	6.4	1.43	153
FCPADS	28741	541.	0.	0.	-541.	148.	603.	4.	60.	6.39	0.15	0.28	36.5	4.96	230.1	0	19.0	4.25	167
FCMCDS	28741	132.	0.	0.	-132.	10.	141.	4.	4.	0.80	0.15	0.12	7.2	0.98	186.1	999	6.2	1.39	156
FCMCDS	28741	395.	0.	0.	-395.	117.	500.	4.	48.	4.80	0.15	0.36	31.1	4.23	269.1	0	14.0	3.13	152

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCON	28951	0.	33.	33.	0.	0.	0.	4.	0.	0.18	0.68	0.	1.4	1.00	202.3	0	2.2	1.00	80
STM141	28951	0.	36.	21.	0.	-2.	12.	4.	1.	0.27	0.68	0.15	2.6	1.83	297.1	8	2.2	0.98	116
STM141	28951	0.	6.	50.	0.	27.	-17. F	4.	1.	0.43	0.68	0.15	4.4	3.13	506.9	6	2.2	0.98	107
STM141	28951	0.	6.	50.	0.	27.	-17. A	4.	1.	0.38	0.68	0.15	4.0	2.84	460.0	9	2.1	0.94	108
STM088	28951	0.	35.	24.	0.	-2.	9.	4.	1.	0.26	0.68	0.11	2.2	1.56	265.6	9	2.2	0.98	113
STM088	28951	0.	7.	52.	0.	26.	-19. F	4.	1.	0.42	0.68	0.11	4.0	2.85	484.1	6	2.2	0.99	102
STM088	28951	0.	7.	52.	0.	26.	-19. A	4.	1.	0.37	0.68	0.11	3.7	2.65	451.5	8	2.1	0.95	102
PEBSTM	28951	0.	4.	47.	0.	29.	-14.	4.	2.	0.48	0.68	0.22	5.9	4.21	613.4	5	2.2	0.99	117
TISTMT	28951	0.	38.	9.	0.	-5.	24.	4.	3.	0.49	0.68	0.29	11.0	7.89	1055.5	0	3.0	1.37	131
TISTMT	28951	0	3.	44.	0.	31.	-12.	4.	3.	0.69	0.68	0.29	14.0	10.03	1342.7	0	3.1	1.41	130
TIHRSG	28951		37.	23.	0.	-3.	10.	4.	1.	0.36	0.68	0.10	9.1	6.51	1032.4	0	3.0	1.36	101
TIHRSG	28951	0.	7.	53.	0.	27.	-20.	4.	1.	0.53	0.68	0.10	11.7	8.41	1333.1	0	3.1	1.42	101
STIRL	28951	43.	1.	5.	-43.	32.	28.	4.	3.	0.25	0.68	0.25	2.7	1.92	211.2	3	2.2	1.01	135
STIRL	28951	0.	45.	5.	0.	-11.	28.	4.	3.	0.25	0.68	0.25	2.7	1.92	211.4	17	2.0	0.89	[illegible]
STIRL	28951	0.	1.	48.	0.	32.	-15.	4.	3.	0.42	0.68	0.25	5.0	3.55	390.2	12	1.9	0.84	121
HEGT85	28951	0.	0.	55.	0.	33.	-23. A	4.	4.	0.79	0.68	0.16	15.5	11.13	956.9	0	3.4	1.53	129
HEGT85	28951	0.	0.	94.	0.	45.	-21. A	4.	9.	0.89	0.68	0.20	23.3	16.70	849.9	0	4.1	1.85	122
HEGT60	28951	0.	0.	55.	0.	33.	-22. A	4.	4.	0.68	0.68	0.17	14.0	10.05	875.4	0	3.1	1.40	127
HEGT60	28951	0.	0.	57.	0.	34.	-22. A	4.	4.	0.59	0.68	0.18	14.2	10.19	843.8	0	3.0	1.36	116
HEGT00	28951	0.	5.	56.	0.	29.	-23. A	4.	2.	0.41	0.68	0.09	8.6	6.16	741.1	0	2.6	1.17	100
FCMCCL	28951	0.	1.	44.	0.	33.	-11.	4.	4.	0.56	0.68	0.32	10.3	7.42	838.2	2	2.5	1.12	130
FCSTCL	28951	0.	0.	42.	0.	33.	-10.	4.	4.	0.79	0.68	0.36	11.3	8.12	911.1	0	2.8	1.24	148
FCSTCL	28951	0.	0.	52.	0.	39.	-2.	4.	6.	0.74	0.68	0.41	12.9	9.25	838.9	1	2.7	1.20	139
IGCTST	28951	0.	0.	47.	0.	33.	-14.	4.	4.	0.73	0.68	0.29	11.4	8.18	827.7	0	2.8	1.26	139
IGCTST	28951	0.	0.	49.	0.	34.	-13.	4.	4.	0.64	0.68	0.30	11.3	8.14	791.5	1	2.7	1.20	128
GTSOAR	28951	0.	46.	1.	0.	-12.	31.	4.	4.	0.24	0.68	0.29	3.6	2.57	270.9	12	2.0	0.89	133
GTAC08	28951	0.	41.	7.	0.	-8.	25.	4.	3.	0.21	0.68	0.26	2.7	1.97	240.1	19	1.9	0.86	133
GTAC12	28951	0.	43.	1.	0.	-10.	31.	4.	4.	0.23	0.68	0.33	3.0	2.18	242.5	19	1.8	0.83	138
GTAC16	28951	0.	44.	0.	0.	-10.	33.	4.	4.	0.30	0.68	0.34	3.4	2.47	268.3	14	1.9	0.87	150
GTAC16	28951	0.	45.	0.	0.	-11.	35.	4.	4.	0.24	0.68	0.35	3.4	2.42	254.4	17	1.8	0.83	139
GTWC16	28951	0.	46.	0.	0.	-13.	33.	4.	4.	0.32	0.68	0.30	3.8	2.73	281.0	10	2.1	0.93	145
GTWC16	28951	0.	50.	0.	0.	-15.	38.	4.	5.	0.25	0.68	0.31	3.8	2.72	261.5	12	2.0	0.89	135
CC1626	28951	0.	46.	0.	0.	-13.	33.	4.	4.	0.43	0.68	0.30	4.2	3.03	312.0	5	2.2	1.00	145
CC1626	28951	0.	67.	0.	0.	-25.	63.	4.	8.	0.40	0.68	0.36	5.3	3.82	270.8	5	2.2	1.01	134
CC1622	28951	0.	45.	0.	0.	-12.	33.	4.	4.	0.42	0.68	0.32	4.0	2.84	297.9	7	2.2	0.97	147
CC1622	28951	0.	61.	0.	0.	-21.	57.	4.	7.	0.37	0.68	0.37	4.7	3.39	263.7	7	2.1	0.95	137
CC1222	28951	0.	45.	0.	0.	-12.	33.	4.	4.	0.42	0.68	0.32	3.8	2.74	288.6	7	2.1	0.96	148
CC1222	28951	0.	61.	0.	0.	-20.	56.	4.	7.	0.37	0.68	0.37	4.5	3.23	253.8	8	2.1	0.94	137
CC0822	28951	0.	44.	0.	0.	-10.	33.	4.	4.	0.41	0.68	0.34	3.9	2.78	303.6	9	2.1	0.94	150
CC0822	28951	0.	51.	0.	0.	-14.	45.	4.	6.	0.35	0.68	0.38	4.1	2.95	274.3	10	2.0	0.90	140
STIG15	28951	0.	59.	0.	0.	-25.	33.	4.	4.	0.43	0.68	0.11	4.5	3.19	258.3	0	2.6	1.17	125
STIG15	28951	0.	1538.	0.	0.	-1094.	1410.	4.	172.	3.19	0.68	0.17	51.1	36.63	113.3	0	22.2	10.01	288
STIG10	28951	0.	56.	0.	0.	-22.	33.	4.	4.	0.40	0.68	0.16	4.1	2.96	253.3	0	2.4	1.10	130

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
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		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
STIG10	28951	0.	151.	0.	0.	-88.	130.	4.	16.	0.52	0.68	0.22	7.8	5.61	176.9	0	3.5	1.58	109
STIG1S	28951	0.	54.	0.	0.	-21.	33.	4.	4.	0.39	0.68	0.18	4.0	2.84	249.8	0	2.4	1.07	133
STIG1S	28951	0.	95.	0.	0.	-48.	77.	4.	9.	0.39	0.68	0.23	5.4	3.88	194.6	0	2.7	1.23	119
DEADV3	28951	0.	50.	0.	0.	-17.	33.	4.	4.	0.43	0.68	0.24	5.7	4.07	385.5	0	2.5	1.12	137
DEADV3	28951	0.	86.	0.	0.	-39.	76.	4.	9.	0.43	0.68	0.30	7.9	5.66	314.6	0	2.8	1.24	125
DEHTPM	28951	0.	43.	0.	0.	-9.	33.	4.	4.	0.42	0.68	0.36	5.3	3.81	425.5	5	2.2	0.99	149
DEHTPM	28951	0.	46.	0.	0.	-11.	39.	4.	5.	0.35	0.63	0.38	5.4	3.89	401.6	7	2.1	0.95	139
DESOA3	28951	52.	0.	0.	-52.	33.	33.	4.	4.	0.41	0.68	0.21	4.8	3.42	310.5	0	2.8	1.25	138
DESOA3	28951	100.	0.	0.	-100.	50.	87.	4.	11.	0.48	0.68	0.27	9.3	6.70	318.3	0	3.8	1.71	127
DESOA3	28951	0.	52.	0.	0.	-19.	33.	4.	4.	0.41	0.68	0.21	4.8	3.42	310.5	0	2.4	1.09	134
DESOA3	28951	0.	100.	0.	0.	-51.	87.	4.	11.	0.48	0.68	0.27	9.3	6.70	318.3	0	3.1	1.42	120
GTSOAD	28951	43.	1.	3.	-43.	32.	30.	4.	4.	0.22	0.68	0.30	2.8	2.01	224.6	9	2.1	0.96	140
GTRA08	28951	45.	0.	0.	-45.	33.	33.	4.	4.	0.35	0.58	0.31	4.3	3.07	321.5	0	2.4	1.08	148
GTRA08	28951	55.	0.	0.	-55.	38.	47.	4.	6.	0.28	[illegible]	0.35	4.7	3.37	290.6	0	2.4	1.08	140
GTRA12	28951	45.	0.	0.	-45.	33.	33.	4.	4.	0.35	[illegible]	[illegible].32	4.2	3.01	317.2	0	2.4	1.07	149
GTRA12	28951	54.	0.	0.	-54.	38.	47.	4.	6.	0.23	[illegible]	[illegible].36	4.6	3.30	288.9	0	2.4	1.07	140
GTRA16	28951	45.	0.	0.	-45.	33.	33.	4.	4.	0.33	[illegible]	[illegible]32	4.4	3.12	329.6	0	2.4	1.08	149
GTRA16	28951	52.	0.	0.	-52.	37.	44.	4.	5.	0.28	[illegible]	0.35	4.7	3.35	304.3	0	2.4	1.07	140
GTR208	28951	45.	0.	0.	-45.	33.	33.	4.	4.	0.32	0.68	0.32	3.8	2.71	285.5	1	2.3	1.04	150
GTR208	28951	48.	0.	0.	-48.	35.	37.	4.	4.	0.25	0.68	0.33	3.8	2.69	267.5	4	2.2	1.01	140
GTR212	28951	45.	0.	0.	-45.	33.	33.	4.	4.	0.33	0.68	0.31	4.0	2.85	299.2	0	2.3	1.06	149
GTR212	28951	50.	0.	0.	-50.	35.	40.	4.	5.	0.26	0.68	0.33	4.0	2.90	276.8	2	2.3	1.03	140
GTR216	28951	45.	0.	0.	-45.	33.	33.	4.	4.	0.33	0.68	0.32	4.1	2.92	309.5	0	2.3	1.06	150
GTR216	28951	50.	0.	0.	-50.	36.	40.	4.	5.	0.26	0.68	0.34	4.2	3.01	286.8	2	2.3	1.04	140
GTRW08	28951	49.	0.	0.	-49.	33.	33.	4.	4.	0.37	0.68	0.26	4.5	3.19	311.1	0	2.6	1.15	143
GTRW08	28951	67.	0.	0.	-67.	41.	57.	4.	7.	0.31	0.68	0.31	5.3	3.83	269.9	0	2.7	1.22	134
GTRW12	28951	48.	0.	0.	-48.	33.	33.	4.	4.	0.36	0.68	0.28	4.5	3.19	317.9	0	2.5	1.14	145
GTRW12	28951	67.	0.	0.	-67.	41.	58.	4.	7.	0.31	0.68	0.33	5.4	3.88	276.3	0	2.7	1.20	136
GTRW16	28951	48.	0.	0.	-48.	33.	33.	4.	4.	0.37	0.68	0.28	4.6	3.29	328.6	0	2.5	1.14	145
GTRW16	28951	64.	0.	0.	-64.	40.	55.	4.	7.	0.31	0.68	0.33	5.4	3.88	290.3	0	2.6	1.19	136
GTR308	28951	50.	0.	0.	-50.	33.	33.	4.	4.	0.34	0.68	0.25	4.0	2.86	274.1	0	2.5	1.13	143
GTR308	28951	58.	0.	0.	-58.	36.	43.	4.	5.	0.27	0.68	0.27	4.2	3.00	246.2	0	2.5	1.14	133
GTR312	28951	47.	0.	0.	-47.	33.	33.	4.	4.	0.35	0.68	0.28	4.1	2.97	298.3	0	2.5	1.11	146
GTR312	28951	59.	0.	0.	-59.	38.	48.	4.	6.	0.28	0.68	0.32	4.6	3.26	264.5	0	2.5	1.12	137
GTR316	28951	48.	0.	0.	-48.	33.	33.	4.	4.	0.35	0.68	0.28	4.3	3.10	309.8	0	2.5	1.12	145
GTR316	28951	58.	0.	0.	-58.	38.	48.	4.	6.	0.29	0.68	0.32	4.7	3.40	277.0	0	2.5	1.13	136
FCPADS	28951	52.	0.	0.	-52.	33.	33.	4.	4.	0.65	0.68	0.21	4.0	2.90	264.1	0	2.9	1.32	142
FCPADS	28951	118.	0.	0.	-118.	56.	108.	4.	13.	1.47	0.68	0.28	8.6	6.15	249.0	0	4.9	2.19	137
FCMCDS	28951	48.	0.	0.	-48.	33.	33.	4.	4.	0.62	0.68	0.28	4.2	2.98	298.3	0	2.7	1.23	149
FCMCDS	28951	86.	0.	0.	-86.	49.	85.	4.	10.	1.12	0.68	0.36	7.3	5.21	289.0	0	3.7	1.69	141

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**				POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
ONOCGN	29111	0.	34.	556.	0.	0.	0.	F	14.	0.	1.47	0.13	0.	23.8	1.00	183.9	0	16.9	1.00	80
STM141	29111	0.	497.	0.	0.	-463.	556.		14.	14.	1.05	0.13	0.16	15.1	0.64	103.7	-16	18.5	1.09	164
STM141	29111	0.	512.	0.	0.	-469.	586.		14.	18.	0.88	0.13	0.19	15.9	0.67	106.1	-15	18.2	1.07	155
STM141	29111	0.	0.	497.	0.	34.	59.	F	14.	14.	2.21	0.13	0.16	33.4	1.40	229.2	17	15.0	0.89	139
STM141	29111	0.	0.	512.	0.	43.	74.	F	14.	18.	1.83	0.13	0.19	29.8	1.25	198.9	32	13.8	0.82	132
STM141	29111	0.	0.	497.	0.	34.	59.	A	14.	14.	2.05	0.13	0.16	26.3	1.10	180.2	59	14.1	0.83	143
STM141	29111	0.	0.	512.	0.	43.	74.	A	14.	18.	1.66	0.13	0.19	21.1	0.89	140.8	999	12.7	0.75	139
STM088	29111	0.	494.	19.	0.	-459.	537.		14.	12.	0.83	0.13	0.13	14.1	0.59	98.6	-16	18.7	1.10	152
STM088	29111	0.	6.	507.	0.	29.	49.	F	14.	12.	1.72	0.13	0.13	27.5	1.16	192.4	38	14.5	0.86	128
STM088	29111	0.	6.	507.	0.	29.	49.	A	14.	12.	1.60	0.13	0.13	19.9	0.84	139.2	999	13.6	0.80	135
PFBSTM	29111	0.	0.	500.	0.	34.	56.		14.	14.	2.64	0.13	0.15	35.9	1.51	244.7	11	15.8	0.93	138
PFBSTM	29111	0.	0.	573.	0.	77.	126.		14.	31.	2.89	0.13	0.26	35.9	1.51	213.9	19	13.9	0.82	130
TISTMT	29111	0.	499.	0.	0.	-465.	556.		14.	14.	1.80	0.13	0.15	44.4	1.87	303.6	0	22.5	1.33	143
TISTMT	29111	0.	619.	0.	0.	-513.	794.		14.	43.	2.77	0.13	0.31	89.1	3.75	490.9	0	26.3	1.55	132
TISTMT	29111	0.	0.	499.	0.	34.	57.		14.	14.	3.03	0.13	0.15	65.6	2.76	448.7	0	19.4	1.14	132
TISTMT	29111	0.	0.	619.	0.	106.	175.		14.	43.	3.99	0.13	0.31	112.8	4.75	622.1	0	21.8	1.29	122
TIHRSG	29111	0.	539.	0.	0.	-504.	556.		14.	14.	2.07	0.13	0.09	58.8	2.47	372.5	0	25.4	1.50	134
TIHRSG	29111	0.	619.	0.	0.	-556.	651.		14.	26.	2.52	0.13	0.13	85.2	3.58	469.9	0	28.9	1.71	124
TIHRSG	29111	0.	0.	539.	0.	34.	17.		14.	14.	3.39	0.13	0.09	82.4	3.46	521.9	0	22.3	1.32	124
TIHRSG	29111	0.	0.	619.	0.	63.	32.		14.	26.	3.77	0.13	0.13	109.0	4.58	601.1	0	24.7	1.46	115
STIRL	29111	528.	0.	0.	-528.	34.	556.		14.	14.	1.20	0.13	0.11	22.1	0.93	142.7	149	24.1	1.43	156
STIRL	29111	744.	0.	0.	-744.	120.	843.		14.	49.	1.49	0.13	0.23	39.3	1.65	180.1	0	27.6	1.63	134
STIRL	29111	0.	528.	0.	0.	-493.	556.		14.	14.	1.20	0.13	0.11	22.1	0.93	142.8	-77	20.4	1.20	150
STIRL	29111	0.	744.	0.	0.	-624.	843.		14.	49.	1.49	0.13	0.23	39.3	1.65	180.3	0	22.3	1.32	126
STIRL	29111	0.	0.	528.	0.	34.	28.		14.	14.	2.39	0.13	0.11	41.3	1.74	267.0	7	16.5	0.98	130
STIRL	29111	0.	0.	744.	0.	120.	99.		14.	49.	2.99	0.13	0.23	69.4	2.92	318.3	5	17.0	1.00	108
HEGT60	29111	0.	0.	588.	0.	34.	-32.	A	14.	14.	2.61	0.13	0.00	52.3	2.20	303.5	0	19.1	1.13	117
HEGT60	29111	0.	0.	2144.	0.	399.	-367.	A	14.	163.	7.44	0.13	0.01	182.0	7.65	289.6	0	36.7	2.17	79
HEGT00	29111	0.	0.	564.	0.	34.	-7.	A	14.	14.	2.55	0.13	0.05	49.6	2.09	300.4	0	18.3	1.08	121
HEGT00	29111	0.	0.	804.	0.	102.	-22.	A	14.	41.	3.10	0.13	0.09	72.0	3.03	305.5	0	20.2	1.19	99
FCMCCL	29111	0.	0.	511.	0.	34.	45.		14.	14.	2.72	0.13	0.13	48.4	2.04	323.3	3	17.5	1.04	132
FCMCCL	29111	0.	0.	797.	0.	174.	227.		14.	71.	4.75	0.13	0.34	83.8	3.52	358.9	4	17.2	1.02	109
FCSTCL	29111	0.	0.	508.	0.	34.	48.		14.	14.	2.72	0.13	0.14	47.4	1.99	318.3	3	17.4	1.03	133
FCSTCL	29111	0.	0.	915.	0.	243.	339.		14.	99.	5.57	0.13	0.39	97.4	4.10	363.3	6	16.1	0.95	106
IGGTST	29111	0.	0.	527.	0.	34.	30.		14.	14.	2.46	0.13	0.11	46.5	1.95	301.2	3	17.3	1.02	129
IGGTST	29111	0.	0.	852.	0.	165.	143.		14.	67.	2.71	0.13	0.27	74.9	3.15	299.8	6	16.0	0.94	101
GTSOAR	29111	0.	530.	0.	0.	-496.	556.		14.	14.	1.13	0.13	0.10	21.9	0.92	140.6	-71	20.3	1.20	150
GTSOAR	29111	0.	963.	0.	0.	-762.	1113.		14.	82.	1.32	0.13	0.27	34.3	1.44	121.7	0	21.9	1.29	120
GTAC08	29111	0.	511.	0.	0.	-476.	556.		14.	14.	1.03	0.13	0.14	17.7	0.74	118.3	-24	19.2	1.13	158
GTAC08	29111	0.	727.	0.	0.	-586.	913.		14.	58.	1.01	0.13	0.31	23.5	0.99	110.3	-55	17.8	1.05	137
GTAC12	29111	0.	512.	0.	0.	-478.	556.		14.	14.	1.10	0.13	0.13	20.9	0.88	138.8	-44	19.6	1.16	154
GTAC12	29111	0.	810.	0.	0.	-632.	1036.		14.	72.	1.14	0.13	0.33	28.2	1.19	118.9	0	18.1	1.07	130
GTAC16	29111	0.	516.	0.	0.	-481.	556.		14.	14.	1.11	0.13	0.13	21.3	0.90	141.0	-52	19.8	1.17	153

COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----------FUEL USE IN BTU*10**6----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTAC16	29111	0.	888.	0.	0.	-682.	1132.	14.	84.	1.27	0.13	0.34	32.8	1.38	126.1	0	18.9	1.11	125
GTWC16	29111	0.	520.	0.	0.	-486.	556.	14.	14.	1.12	0.13	0.12	21.5	0.91	141.1	-58	20.0	1.18	152
GTWC16	29111	0.	925.	0.	0.	-715.	1142.	14.	85.	1.23	0.13	0.32	30.8	1.30	113.7	0	19.5	1.15	125
CC1626	29111	0.	522.	0.	0.	-488.	556.	14.	14.	1.21	0.13	0.12	21.6	0.91	141.2	-76	20.2	1.19	152
CC1626	29111	0.	1168.	0.	0.	-861.	1472.	14.	126.	1.69	0.13	0.34	41.8	1.76	122.0	0	20.9	1.23	118
CC1622	29111	0.	519.	0.	0.	-484.	556.	14.	14.	1.20	0.13	0.12	21.4	0.90	140.5	-67	20.0	1.18	153
CC1622	29111	0.	1066.	0.	0.	-790.	1367.	14.	113.	1.60	0.13	0.35	39.9	1.68	127.6	0	19.9	1.18	120
CC1222	29111	0.	518.	0.	0.	-484.	556.	14.	14.	1.20	0.13	0.12	21.0	0.88	138.3	-58	20.0	1.18	153
CC1222	29111	0.	1057.	0.	0.	-782.	1360.	14.	112.	1.57	0.13	0.35	37.7	1.59	121.8	0	19.5	1.15	121
CC0822	29111	0.	513.	0.	0.	-479.	556.	14.	14.	1.20	0.13	0.13	21.1	0.89	140.1	-56	19.8	1.17	154
CC0822	29111	0.	893.	0.	0.	-677.	1165.	14.	88.	1.37	0.13	0.35	31.0	1.30	118.5	0	18.2	1.07	127
DEHTPM	29111	0.	525.	0.	0.	-491.	556.	14.	14.	1.37	0.13	0.11	27.6	1.16	179.2	0	21.0	1.24	146
DEHTPM	29111	0.	872.	0.	0.	-696.	1032.	14.	72.	2.26	0.13	0.28	65.5	2.76	256.4	0	25.3	1.49	117
GTSOAD	29111	517.	0.	0.	-517.	34.	556.	14.	14.	1.09	0.13	0.12	20.2	0.85	133.5	-81	23.4	1.38	159
GTSOAD	29111	826.	0.	0.	-826.	173.	1022.	14.	71.	1.06	0.13	0.31	25.0	1.05	103.2	0	24.5	1.45	140
GTRA08	29111	530.	0.	0.	-530.	34.	556.	14.	14.	1.14	0.13	0.10	22.3	0.94	143.9	169	24.2	1.43	155
GTRA08	29111	1316.	0.	0.	-1316.	338.	1571.	14.	138.	1.87	0.13	0.31	54.2	2.28	140.7	0	34.0	2.01	128
GTRA12	29111	527.	0.	0.	-527.	34.	556.	14.	14.	1.14	0.13	0.11	22.4	0.94	144.8	167	24.1	1.42	156
GTRA12	29111	1235.	0.	0.	-1235.	318.	1505.	14.	130.	1.72	0.13	0.32	48.7	2.05	134.4	0	31.7	1.87	128
GTRA16	29111	526.	0.	0.	-526.	34.	556.	14.	14.	1.15	0.13	0.11	22.8	0.96	148.2	999	24.1	1.42	155
GTRA16	29111	1151.	0.	0.	-1151.	289.	1408.	14.	118.	1.69	0.13	0.32	48.0	2.02	142.2	0	30.7	1.82	128
GTR208	29111	525.	0.	0.	-525.	34.	556.	14.	14.	1.12	0.13	0.11	21.7	0.91	140.9	124	23.9	1.41	157
GTR208	29111	999.	0.	0.	-999.	230.	1211.	14.	94.	1.39	0.13	0.31	36.9	1.55	125.9	0	28.2	1.67	131
GTR212	29111	525.	0.	0.	-525.	34.	556.	14.	14.	1.13	0.13	0.11	22.0	0.92	143.0	140	23.9	1.41	156
GTR212	29111	1040.	0.	0.	-1040.	247.	1267.	14.	101.	1.47	0.13	0.31	39.7	1.67	130.1	0	28.8	1.70	130
GTR216	29111	523.	0.	0.	-523.	34.	556.	14.	14.	1.14	0.13	0.11	22.3	0.94	145.4	160	23.9	1.41	156
GTR216	29111	1050.	0.	0.	-1050.	254.	1292.	14.	104.	1.54	0.13	0.32	42.6	1.79	138.5	0	28.9	1.71	129
GTRW08	29111	539.	0.	0.	-539.	34.	556.	14.	14.	1.14	0.13	0.09	22.4	0.94	141.7	179	24.8	1.45	154
GTRW08	29111	1564.	0.	0.	-1564.	395.	1762.	14.	161.	1.98	0.13	0.27	57.2	2.41	124.9	0	39.4	2.33	129
GTRW12	29111	533.	0.	0.	-533.	34.	556.	14.	14.	1.14	0.13	0.10	22.4	0.94	143.1	173	24.3	1.44	155
GTRW12	29111	1484.	0.	0.	-1484.	388.	1741.	14.	158.	1.79	0.13	0.30	49.9	2.10	114.7	0	35.8	2.12	130
GTRW16	29111	532.	0.	0.	-532.	34.	556.	14.	14.	1.15	0.13	0.10	22.7	0.95	145.8	206	24.3	1.44	155
GTRW16	29111	1360.	0.	0.	-1360.	349.	1609.	14.	142.	1.73	0.13	0.31	48.4	2.03	121.4	0	34.0	2.01	129
GTR308	29111	544.	0.	0.	-544.	34.	556.	14.	14.	1.13	0.13	0.08	21.8	0.92	136.7	142	24.7	1.46	154
GTR308	29111	1316.	0.	0.	-1316.	293.	1422.	14.	120.	1.49	0.13	0.23	39.0	1.64	101.1	0	35.6	2.11	128
GTR312	29111	529.	0.	0.	-529.	34.	556.	14.	14.	1.13	0.13	0.10	21.8	0.92	141.0	136	24.1	1.42	156
GTR312	29111	1180.	0.	0.	-1180.	290.	1412.	14.	118.	1.50	0.13	0.31	40.3	1.69	116.5	0	30.8	1.82	129
GTR316	29111	529.	0.	0.	-529.	34.	556.	14.	14.	1.14	0.13	0.10	22.2	0.94	143.4	160	24.1	1.43	156
GTR316	29111	1169.	0.	0.	-1169.	285.	1395.	14.	116.	1.53	0.13	0.30	41.4	1.74	120.7	0	30.9	1.83	129
FCPADS	29111	542.	0.	0.	-542.	34.	556.	14.	14.	2.45	0.13	0.08	24.7	1.04	155.8	0	26.2	1.55	153
FCPADS	29111	2206.	0.	0.	-2206.	602.	2458.	14.	246.	27.73	0.13	0.28	141.3	5.94	218.6	0	81.9	4.84	180
FCMCDS	29111	525.	0.	0.	-525.	34.	556.	14.	14.	2.35	0.13	0.11	25.2	1.06	164.0	0	25.5	1.51	155
FCMCDS	29111	1609.	0.	0.	-1609.	477.	2037.	14.	194.	20.74	0.13	0.36	121.2	5.10	257.0	0	59.9	3.54	160

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ECS	PROCS	FUEL USE IN BTU*10**6 — **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	29112	0.	128.	1995.	0.	0.	0.	F	52.	0.	3.85	0.13	0.	77.5	1.00	168.7	0	58.8	1.00	80
STM141	29112	0.	1777.	0.	0.	-1649.	1995.		52.	52.	2.08	0.13	0.16	44.9	0.58	86.2	-14	63.6	1.08	167
STM141	29112	0.	1811.	0.	0.	-1663.	2064.		52.	60.	1.80	0.13	0.18	44.0	0.57	83.0	-12	62.6	1.06	158
STM141	29112	0.	0.	1777.	0.	128.	218.	F	52.	52.	4.99	0.13	0.16	90.4	1.17	173.6	48	47.6	0.81	142
STM141	29112	0.	0.	1811.	0.	148.	253.	F	52.	60.	4.69	0.13	0.18	93.8	1.21	176.7	43	46.6	0.79	132
STM141	29112	0.	0.	1777.	0.	128.	218.	A	52.	52.	4.87	0.13	0.16	72.0	0.93	138.4	999	45.5	0.77	147
STM141	29112	0.	0.	1811.	0.	148.	253.	A	52.	60.	4.50	0.13	0.18	69.6	0.90	131.2	999	43.8	0.75	138
STM088	29112	0.	1758.	101.	0.	-1630.	1894.		52.	40.	1.69	0.13	0.12	39.8	0.51	78.7	-15	65.2	1.11	155
STM088	29112	0.	30.	1829.	0.	97.	167.	F	52.	40.	4.36	0.13	0.12	87.7	1.13	173.3	48	50.0	0.85	127
STM088	29112	0.	30.	1829.	0.	97.	167.	A	52.	40.	4.20	0.13	0.12	61.3	0.79	121.0	999	46.9	0.80	135
PFBSTM	29112	0.	0.	1788.	0.	128.	207.		52.	52.	6.57	0.13	0.16	91.5	1.18	174.7	38	49.5	0.84	142
PFBSTM	29112	0.	0.	2030.	0.	268.	436.		52.	109.	7.86	0.13	0.26	84.8	1.09	142.5	103	43.0	0.73	136
TISTMT	29112	0.	1783.	0.	0.	-1656.	1995.		52.	52.	4.21	0.13	0.16	126.0	1.63	241.1	0	74.7	1.27	145
TISTMT	29112	0.	2190.	0.	0.	-1821.	2803.		52.	150.	6.71	0.13	0.31	234.2	3.02	364.9	0	81.9	1.39	132
TISTMT	29112	0.	0.	1783.	0.	128.	212.		52.	52.	7.18	0.13	0.16	177.6	2.29	339.8	4	59.4	1.01	132
TISTMT	29112	0.	0.	2190.	0.	369.	613.		52.	150.	9.91	0.13	0.31	294.5	3.80	458.9	3	62.4	1.06	120
TIHRSG	29112	0.	1930.	0.	0.	-1803.	1995.		52.	52.	4.95	0.13	0.09	160.8	2.07	284.4	0	83.4	1.42	136
TIHRSG	29112	0.	2200.	0.	0.	-1977.	2313.		52.	91.	6.28	0.13	0.13	226.2	2.92	351.0	0	92.4	1.57	126
TIHRSG	29112	0.	0.	1930.	0.	128.	65.		52.	52.	8.09	0.13	0.09	213.4	2.75	377.4	0	66.9	1.14	124
TIHRSG	29112	0.	0.	2200.	0.	222.	113.		52.	91.	9.61	0.13	0.13	286.8	3.70	444.9	0	73.5	1.25	113
STIRL	29112	1890.	0.	0.	-1890.	128.	1995.		52.	52.	2.92	0.13	0.11	76.7	0.99	138.6	999	84.8	1.44	155
STIRL	29112	2644.	0.	0.	-2644.	427.	2997.		52.	174.	4.15	0.13	0.23	133.8	1.73	172.7	0	96.9	1.65	134
STIRL	29112	0.	1890.	0.	0.	-1762.	1995.		52.	52.	2.92	0.13	0.11	76.8	0.99	138.7	999	71.3	1.21	149
STIRL	29112	0.	2644.	0.	0.	-2218.	2997.		52.	174.	4.15	0.13	0.23	134.0	1.73	173.0	0	77.9	1.32	126
STIRL	29112	0.	0.	1890.	0.	128.	105.		52.	52.	6.06	0.13	0.11	130.0	1.68	234.8	10	54.8	0.93	130
STIRL	29112	0.	0.	2644.	0.	427.	353.		52.	174.	8.92	0.13	0.23	239.3	3.09	308.7	5	58.4	0.99	108
HEGT60	29112	0.	0.	2112.	0.	128.	-117.	A	52.	52.	6.64	0.13	0.00	147.7	1.91	238.7	1	61.7	1.05	117
HEGT60	29112	0.	0.	7623.	0.	1419.	-1304.	A	52.	579.	22.61	0.13	0.01	545.7	7.04	244.3	0	116.1	1.98	75
HEGT00	29112	0.	0.	2023.	0.	128.	-28.	A	52.	52.	6.25	0.13	0.05	130.7	1.69	220.4	6	57.8	0.98	123
HEGT00	29112	0.	0.	2857.	0.	361.	-79.	A	52.	147.	8.12	0.13	0.09	176.8	2.28	211.2	3	60.8	1.03	101
FCMCCL	29112	0.	0.	1829.	0.	128.	167.		52.	52.	6.95	0.13	0.14	131.1	1.69	244.7	9	55.3	0.94	134
FCMCCL	29112	0.	0.	2832.	0.	619.	808.		52.	252.	13.65	0.13	0.34	212.3	2.74	255.8	10	49.1	0.83	109
FCSTCL	29112	0.	0.	1817.	0.	128.	178.		52.	52.	6.79	0.13	0.14	128.9	1.66	242.0	10	54.7	0.93	134
FCSTCL	29112	0.	0.	3238.	0.	855.	1193.		52.	349.	15.82	0.13	0.39	245.9	3.17	259.1	11	43.0	0.73	104
IGGTST	29112	0.	0.	1886.	0.	128.	109.		52.	52.	5.43	0.13	0.11	121.7	1.57	220.3	12	53.8	0.92	131
IGGTST	29112	0.	0.	3015.	0.	581.	497.		52.	237.	6.38	0.13	0.26	206.4	2.66	233.6	11	47.7	0.81	102
GTSOAR	29112	0.	1900.	0.	0.	-1772.	1995.		52.	52.	2.36	0.13	0.11	58.3	0.75	104.7	-31	69.1	1.17	155
GTSOAR	29112	0.	3422.	0.	0.	-2709.	3956.		52.	291.	3.50	0.13	0.27	110.6	1.43	110.3	0	75.9	1.29	122
GTAC08	29112	0.	1827.	0.	0.	-1699.	1995.		52.	52.	2.28	0.13	0.14	55.1	0.71	103.0	-23	66.3	1.13	160
GTAC08	29112	0.	2584.	0.	0.	-2082.	3247.		52.	204.	2.57	0.13	0.31	76.3	0.98	100.8	-57	62.1	1.06	139
GTAC12	29112	0.	1833.	0.	0.	-1706.	1995.		52.	52.	2.31	0.13	0.14	56.6	0.73	105.4	-25	66.7	1.13	159
GTAC12	29112	0.	2879.	0.	0.	-2248.	3681.		52.	257.	2.99	0.13	0.33	92.2	1.19	109.3	0	62.9	1.07	131
GTAC16	29112	0.	1845.	0.	0.	-1717.	1995.		52.	52.	2.34	0.13	0.13	58.1	0.75	107.4	-27	67.3	1.14	158

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		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTAC16	29112	0.	3158.	0.	0.	-2425.	4023.	52.	299.	3.49	0.13	0.34	111.3	1.44	120.3	0	65.9	1.12	125
GTWC16	29112	0.	1863.	0.	0.	-1735.	1995.	52.	52.	2.32	0.13	0.12	57.1	0.74	104.6	-27	67.7	1.15	157
GTWC16	29112	0.	3287.	0.	0.	-2543.	4060.	52.	304.	3.15	0.13	0.32	97.2	1.25	100.8	0	67.3	1.14	126
CC1626	29112	0.	1870.	0.	0.	-1742.	1995.	52.	52.	2.44	0.13	0.12	57.3	0.74	104.5	-30	68.?	1.16	157
CC1626	29112	0.	4134.	0.	0.	-3049.	5200.	52.	442.	4.23	0.13	0.34	128.3	1.66	106.4	0	70.3	1.21	119
CC1622	29112	0.	1857.	0.	0.	-1730.	1995.	52.	52.	2.44	0.13	0.13	57.9	0.75	106.4	-30	67.9	1.15	157
CC1622	29112	0.	3773.	0.	0.	-2800.	4828.	52.	397.	4.18	0.13	0.35	132.0	1.70	119.4	0	68.9	1.17	120
CC1222	29112	0.	1854.	0.	0.	-1727.	1995.	52.	52.	2.43	0.13	0.13	56.8	0.73	104.6	-28	67.7	1.15	158
CC1222	29112	0.	3738.	0.	0.	-2772.	4805.	52.	394.	4.05	0.13	0.35	123.2	1.59	112.5	0	67.3	1.14	121
CC0822	29112	0.	1835.	0.	0.	-1707.	1995.	52.	52.	2.42	0.13	0.14	56.1	0.72	104.3	-26	67.0	1.14	159
CC0822	29112	0.	3159.	0.	0.	-2398.	4115.	52.	310.	3.26	0.13	0.35	94.0	1.21	101.5	0	61.9	1.05	129
DEHTPH	29112	0.	1800.	0.	0.	-1752.	1995.	52.	52.	3.21	0.13	0.11	86.0	1.11	156.2	0	72.2	1.23	148
DEHTPH	29112	0.	3100.	0.	0.	-2473.	3668.	52.	256.	6.63	0.13	0.28	225.6	2.91	248.3	0	88.0	1.50	117
GTSOAD	29112	1851.	0.	0.	-1851.	128.	1995.	52.	52.	2.26	0.13	0.13	54.4	0.70	100.3	-49	80.3	1.37	165
GTSOAD	29112	2937.	0.	0.	-2937.	616.	3632.	52.	251.	2.80	0.13	0.31	84.3	1.09	96.0	0	86.1	1.46	141
GTRA08	29112	1899.	0.	0.	-1899.	128.	1995.	52.	52.	2.39	0.13	0.11	59.8	0.77	107.5	-65	82.9	1.41	160
GTRA08	29112	4677.	0.	0.	-4677.	1200.	5586.	52.	489.	5.11	0.13	0.31	171.6	2.21	125.2	0	117.4	2.00	128
GTRA12	29112	1887.	0.	0.	-1887.	128.	1995.	52.	52.	2.40	0.13	0.11	60.3	0.78	109.0	-65	82.5	1.40	161
GTRA12	29112	4391.	0.	0.	-4391.	1130.	5351.	52.	461.	4.94	0.13	0.32	165.6	2.14	128.7	0	111.3	1.89	128
GTRA16	29112	1882.	0.	0.	-1882.	128.	1995.	52.	52.	2.43	0.13	0.11	61.4	0.79	111.4	-69	82.4	1.40	160
GTRA16	29112	4091.	0.	0.	-4091.	1026.	5004.	52.	418.	4.87	0.13	0.32	163.5	2.11	136.4	0	107.6	1.83	128
GTR208	29112	1878.	0.	0.	-1878.	128.	1995.	52.	52.	2.35	0.13	0.12	58.2	0.75	105.7	-59	81.8	1.39	162
GTR208	29112	3552.	0.	0.	-3552.	817.	4303.	52.	333.	3.72	0.13	0.31	119.3	1.54	114.7	0	98.2	1.67	132
GTR212	29112	1878.	0.	0.	-1878.	128.	1995.	52.	52.	2.37	0.13	0.12	59.0	0.76	107.2	-61	82.0	1.39	162
GTR212	29112	3698.	0.	0.	-3698.	877.	4505.	52.	358.	3.97	0.13	0.31	128.7	1.66	118.5	0	100.2	1.70	130
GTR216	29112	1873.	0.	0.	-1873.	128.	1995.	52.	52.	2.40	0.13	0.12	60.2	0.78	109.6	-64	81.9	1.39	161
GTR216	29112	3731.	0.	0.	-3731.	904.	4594.	52.	369.	4.23	0.13	0.32	139.0	1.79	127.1	0	100.6	1.71	130
GTRW08	29112	1931.	0.	0.	-1931.	128.	1995.	52.	52.	2.46	0.13	0.09	62.5	0.81	110.5	-78	84.5	1.44	158
GTRW08	29112	5559.	0.	0.	-5559.	1402.	6264.	52.	572.	4.87	0.13	0.27	159.9	2.06	96.1	0	133.7	2.27	131
GTRW12	29112	1911.	0.	0.	-1911.	128.	1995.	52.	52.	2.45	0.13	0.10	62.5	0.81	111.6	-76	83.7	1.42	159
GTRW12	29112	5273.	0.	0.	-5273.	1380.	6187.	52.	563.	4.81	0.13	0.30	158.1	2.04	102.3	0	124.2	2.11	131
GTRW16	29112	1904.	0.	0.	-1904.	128.	1995.	52.	52.	2.39	0.13	0.10	59.8	0.77	107.3	-66	83.1	1.41	160
GTRW16	29112	4833.	0.	0.	-4833.	1240.	5720.	52.	506.	4.66	0.13	0.31	153.3	1.98	108.3	0	117.9	2.01	130
GTR308	29112	1949.	0.	0.	-1949.	128.	1995.	52.	52.	2.36	0.13	0.08	58.0	0.75	101.6	-64	84.6	1.44	159
GTR308	29112	4676.	0.	0.	-4676.	1042.	5056.	52.	425.	4.07	0.13	0.23	130.0	1.68	94.9	0	125.0	2.13	128
GTR312	29112	1893.	0.	0.	-1893.	128.	1995.	52.	52.	2.34	0.13	0.11	57.8	0.75	104.3	-59	82.4	1.40	161
GTR312	29112	4194.	0.	0.	-4194.	1031.	5020.	52.	420.	4.03	0.13	0.31	129.7	1.67	105.6	0	107.0	1.82	130
GTR316	29112	1894.	0.	0.	-1894.	128.	1995.	52.	52.	2.36	0.13	0.11	58.7	0.76	105.8	-61	82.6	1.40	161
GTR316	29112	4157.	0.	0.	-4157.	1013.	4959.	52.	413.	4.12	0.13	0.30	133.3	1.72	109.4	0	107.5	1.83	130
FCPADS	29112	1942.	0.	0.	-1942.	128.	1995.	52.	52.	7.71	0.13	0.09	77.8	1.00	136.6	999	91.8	1.56	155
FCPADS	29112	7841.	0.	0.	-7841.	2142.	8738.	52.	873.	96.88	0.13	0.28	459.1	5.92	199.8	0	285.5	4.86	181
FCMCDS	29112	1881.	0.	0.	-1881.	128.	1995.	52.	52.	7.36	0.13	0.11	79.6	1.03	144.5	0	89.2	1.52	157
FCMCDS	29112	5721.	0.	0.	-5721.	1694.	7240.	52.	691.	72.32	0.13	0.36	397.3	5.12	237.0	0	206.5	3.55	160

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		-----------FUEL USE IN BTU*10**6-----------																			
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	29113	0.	309.	4613.	0.	0.	0.	F	126.	0.	7.69	0.14	0.	167.8	1.00	160.0	0	134.5	1.00	80
STM141	29113	0.	4085.	0.	0.	-3776.	4613.		126.	126.	3.75	0.14	0.17	100.3	0.60	83.8	-14	144.8	1.08	167
STM141	29113	0.	4165.	0.	0.	-3807.	4777.		126.	146.	3.30	0.14	0.19	96.1	0.57	78.7	-12	142.4	1.06	159
STM141	29113	0.	0.	4085.	0.	309.	529.	F	126.	126.	9.85	0.14	0.17	202.1	1.20	168.8	45	107.3	0.80	142
STM141	29113	0.	0.	4165.	0.	358.	612.	F	126.	146.	9.50	0.14	0.19	206.5	1.23	169.2	44	104.9	0.78	132
STM141	29113	0.	0.	4085.	0.	309.	529.	A	126.	126.	9.51	0.14	0.17	150.5	0.90	125.7	999	101.4	0.75	148
STM141	29113	0.	0.	4165.	0.	358.	612.	A	126.	146.	9.10	0.14	0.19	145.2	0.87	119.0	999	97.8	0.73	140
STM088	29113	0.	4041.	229.	0.	-3732.	4385.		126.	98.	3.00	0.14	0.13	84.5	0.50	72.6	-15	148.1	1.10	156
STM088	29113	0.	68.	4201.	0.	241.	412.	F	126.	98.	8.49	0.14	0.13	182.0	1.08	156.3	82	111.1	0.83	129
STM088	29113	0.	68.	4201.	0.	241.	412.	A	126.	98.	8.70	0.14	0.13	137.8	0.82	118.4	999	106.5	0.79	135
PFBSTM	29113	0.	0.	4109.	0.	309.	505.		126	126.	12.85	0.14	0.17	174.4	1.04	144.9	179	107.7	0.80	145
PFBSTM	29113	0.	0.	4665.	0.	633.	1034.		126.	258.	17.06	0.14	0.26	191.1	1.14	139.0	78	97.3	0.72	136
TISTMT	29113	0.	4039.	0.	0.	-3790.	4613.		126.	126.	7.71	0.14	0.17	251.8	1.50	209.6	0	165.6	1.23	147
TISTMT	29113	0.	5037.	0.	0.	-4172.	6477.		126.	353.	15.39	0.14	0.31	566.8	3.38	383.9	0	191.3	1.42	132
TISTMT	29113	0.	0.	4099.	0.	309.	514.		126.	126.	13.55	0.14	0.17	352.7	2.10	293.6	8	127.6	0.95	133
TISTMT	29113	0.	0.	5037.	0.	866.	1440.		126.	353.	22.61	0.14	0.31	715.0	4.26	484.3	3	147.2	1.09	121
TIHRSG	29113	0.	4456.	0	0.	-4147.	4613.		126.	126.	10.45	0.14	0.09	368.9	2.20	282.5	0	191.4	1.42	136
TIHRSG	29113	0.	5020.	0.	0.	-4512.	5278.		126.	207.	14.47	0.14	0.13	545.4	3.25	370.8	0	215.6	1.60	124
TIHRSG	29113	0.	0.	4456.	0.	309.	157.		126.	126.	17.30	0.14	0.09	496.2	2.96	380.0	0	153.4	1.14	123
TIHRSG	29113	0.	0.	5020.	0.	508.	259.		126.	207.	21.96	0.14	0.13	693.2	4.13	471.3	0	173.4	1.29	113
STIRL	29113	4358.	0	0.	-4358.	309.	4613.		126.	126.	5.52	0.14	0.11	167.0	1.00	130.8	999	193.4	1.44	156
STIRL	29113	6035.	0.	0.	-6035.	974.	6840.		126.	397.	8.19	0.14	0.23	264.5	1.70	160.9	0	219.1	1.63	136
STIRL	29113	0.	4358.	0.	0.	-4049.	4613.		126.	126.	5.52	0.14	0.11	167.2	1.00	130.9	999	162.0	1.20	150
STIRL	29113	0.	6035.	0.	0.	-5061.	6840.		126.	397.	8.20	0.14	0.23	284.9	1.70	161.1	0	175.7	1.31	128
STIRL	29113	0.	0.	4358.	0.	309.	255.		126.	126.	12.33	0.14	0.11	295.2	1.76	231.2	11	124.1	0.92	129
STIRL	29113	0.	0.	6035.	0.	974.	805.		126.	397.	18.69	0.14	0.23	524.2	3.12	296.4	6	130.8	0.97	108
HEGT60	29113	0.	0.	4897.	0.	309.	-284.	A	126.	126.	12.73	0.14	0.01	286.7	1.71	199.8	5	134.4	1.00	118
HEGT60	29113	0.	0.	17396.	0.	3238.	-2976.	A	126.	1321.	51.49	0.14	0.01	1279.6	7.63	251.0	0	270.1	2.01	78
HEGT00	29113	0.	0.	4681.	0.	309.	-67.	A	126.	126.	12.09	0.14	0.05	256.3	1.53	186.8	11	126.4	0.94	128
HEGT00	29113	0.	0.	6520.	0.	825.	-180.	A	126.	336.	17.45	0.14	0.09	387.4	2.31	202.8	4	137.4	1.02	101
FCMCCL	29113	0.	0.	4210.	0.	309.	403.		126.	126.	14.12	0.14	0.14	272.8	1.63	221.1	12	122.2	0.91	135
FCMCCL	29113	0.	0.	6462.	0.	1412.	1844.		126.	576.	27.43	0.14	0.34	367.0	2.19	193.8	16	96.7	0.72	112
FCSTCL	29113	0.	0.	4181.	0.	309.	432.		126.	126.	13.65	0.14	0.15	269.6	1.61	220.1	13	120.9	0.90	135
FCSTCL	29113	0.	0.	7445.	0.	1983.	2772.		126.	809.	32.01	0.14	0.39	430.9	2.57	197.5	17	79.4	0.59	105
IGGTST	29113	0.	0.	4346.	0.	309.	268.		126.	126.	10.27	0.14	0.12	255.8	1.52	200.9	15	119.0	0.88	132
IGGTST	29113	0.	0.	6936.	0.	1353.	1172.		126.	552.	12.06	0.14	0.27	419.5	2.50	206.4	13	100.8	0.75	103
GTSOAR	29113	0.	4382.	0.	0.	-4073.	4613.		126.	126.	4.44	0.14	0.11	129.3	0.77	100.7	-34	157.7	1.17	155
GTSOAR	29113	0.	7809.	0.	0.	-6182.	9028.		126.	664.	6.70	0.14	0.27	228.6	1.36	99.9	0	170.9	1.27	123
GTAC08	29113	0.	4205.	0.	0.	-3896.	4613.		126.	126.	4.08	0.14	0.15	115.4	0.69	93.6	-21	150.3	1.12	161
GTAC08	29113	0.	5896.	0.	0.	-4752.	7410.		126.	467.	4.71	0.14	0.31	153.0	0.91	88.6	-21	139.9	1.04	142
GTAC12	29113	0.	4221.	0.	0.	-3912.	4613.		126.	126.	4.17	0.14	0.14	119.2	0.71	96.4	-23	151.2	1.12	160
GTAC12	29113	0.	6570.	0.	0.	-5129.	8400.		126.	587.	5.33	0.14	0.33	188.3	1.12	97.8	0	141.6	1.05	134
GTAC16	29113	0.	4249.	0.	0.	-3940.	4613.		126.	126.	4.33	0.14	0.14	125.8	0.75	101.0	-27	153.0	1.14	158

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GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		------FUEL USE IN BTU*10**6------																		
		COGENERATION CASE			**NOCOGEN - COGFN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
FCS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTAC16	29113	0.	7207.	0.	0.	-5534.	9180.	126.	682.	6.58	0.14	0.34	225.1	1.34	106.6	0	147.5	1.10	127
GTWC16	29113	0.	4293.	0.	0.	-3984.	4613.	126.	126.	4.23	0.14	0.13	121.6	0.73	96.7	-26	153.9	1.14	158
GTWC16	29113	0.	7502.	0.	0.	-5804.	9265.	126.	693.	5.75	0.14	0.32	191.3	1.14	87.0	0	150.4	1.12	129
CC1626	29113	0.	4308.	0.	0.	-3999.	4613.	126.	126.	4.38	0.14	0.12	122.1	0.73	96.7	-29	154.9	1.15	158
CC1626	29113	0.	9508.	0.	0.	-6936.	11991.	126.	1025.	7.86	0.14	0.34	258.3	1.54	92.7	0	157.0	1.17	120
CC1622	29113	0.	4277.	0.	0.	-3968.	4613.	126.	126.	4.43	0.14	0.13	125.3	0.75	100.0	-30	154.3	1.15	158
CC1622	29113	0.	8677.	0.	0.	-6421.	11131.	126.	920.	8.02	0.14	0.35	275.7	1.64	106.4	0	153.7	1.14	121
CC1222	29113	0.	4271.	0.	0.	-3962.	4613.	126.	126.	4.40	0.14	0.13	122.9	0.73	96.2	-28	153.8	1.14	158
CC1222	29113	0.	8599.	0.	0.	-6358.	11082.	126.	914.	7.75	0.14	0.35	256.0	1.53	101.6	0	150.1	1.12	122
CC0822	29113	0.	4224.	0.	0.	-3915.	4613.	126.	126.	4.35	0.14	0.14	120.5	0.72	97.4	-25	152.0	1.13	160
CC0822	29113	0.	7267.	0.	0.	-5499.	9495.	126.	721.	6.24	0.14	0.35	199.4	1.19	93.6	0	139.1	1.03	130
DEHTPH	29113	0.	4334.	0.	0.	-4025.	4613.	126.	126.	6.23	0.14	0.12	192.4	1.15	151.5	0	164.6	1.22	147
DEHTPH	29113	0.	7075.	0.	0.	-5644.	8371.	126.	584.	13.41	0.14	0.28	483.4	2.88	233.2	0	197.3	1.47	118
GTSOAD	29113	4265.	0.	0.	-4265.	309.	4613.	126.	126.	4.12	0.14	0.13	117.0	0.70	93.6	-50	183.1	1.36	165
GTSOAD	29113	6703.	0.	0.	-6703.	1407.	8288.	126.	574.	5.06	0.14	0.31	162.7	0.97	82.8	999	193.5	1.44	145
GTRA08	29113	4379.	0.	0.	-4379.	309.	4613.	126.	126.	4.51	0.14	0.11	132.9	0.79	103.6	-73	189.6	1.41	160
GTRA08	29113	10673.	0.	0.	-10673.	2739.	12748.	126.	1117.	10.13	0.14	0.31	361.2	2.15	115.5	0	264.8	1.97	128
GTRA12	29113	4351.	0.	0.	-4351.	309.	4613.	126	126.	4.42	0.14	0.12	129.4	0.77	101.5	-66	188.0	1.40	161
GTRA12	29113	10021.	0.	0.	-10021.	2578.	12211.	126.	1051.	9.72	0.14	0.32	345.6	2.06	117.7	0	250.4	1.86	129
GTRA16	29113	4338.	0.	0.	-4338.	309.	4613.	126.	126.	4.47	0.14	0.12	131.6	0.78	103.5	-69	187.8	1.40	161
GTRA16	29113	9335.	0.	0.	-9335.	2342.	11419.	126.	955.	9.50	0.14	0.32	338.1	2.02	123.6	0	242.2	1.80	129
GTR208	29113	4329.	0.	0.	-4329	309.	4613.	126.	126.	4.42	0.14	0.12	129.2	0.77	101.8	-65	187.2	1.39	162
GTR208	29113	8106.	0.	0.	-8106.	1864.	9820.	126.	760.	7.21	0.14	0.31	248.5	1.48	104.6	0	221.8	1.65	133
GTR212	29113	4329.	0.	0.	-4329.	309.	4613.	126.	126.	4.36	0.14	0.12	126.7	0.76	99.9	-62	186.8	1.39	162
GTR212	29113	8440.	0.	0.	-8440.	2002.	10280.	126.	816.	7.74	0.14	0.31	269.0	1.60	106.8	0	226.2	1.68	132
GTR216	29113	4318.	0.	0.	-4318.	309.	4613.	126.	126.	4.42	0.14	0.12	129.5	0.77	102.3	-65	186.8	1.39	162
GTR216	29113	8515.	0.	0.	-8515.	2063.	10484.	126.	841.	8.32	0.14	0.32	292.2	1.74	117.1	0	227.2	1.69	131
GTRW08	29113	4458.	0.	0.	-4458.	309.	4613.	126.	126.	4.37	0.14	0.09	127.0	0.76	97.2	-67	191.9	1.43	160
GTRW08	29113	12687.	0.	0.	-12687.	3201.	14294.	126.	1305.	9.85	0.14	0.27	347.3	2.07	93.4	0	303.6	2.26	131
GTRW12	29113	4409.	0.	0.	-4409.	309.	4613.	126.	126.	4.36	0.14	0.10	126.9	0.76	96.2	-65	190.0	1.41	161
GTRW12	29113	12034.	0.	0.	-12034.	3149.	4119.	126.	1284.	9.53	0.14	0.30	335.3	2.00	95.1	0	280.8	2.09	131
GTRW16	29113	4392.	0.	0.	-4392.	309.	4613.	126.	126.	4.44	0.14	0.11	130.2	0.78	101.2	-69	189.8	1.41	160
GTRW16	29113	11030.	0.	0.	-11030.	2830.	13054.	126.	1154.	9.07	0.14	0.31	318.3	1.90	98.5	0	265.8	1.97	130
GTR308	29113	4501.	0.	0.	-4501.	309.	4613.	126.	126.	4.25	0.14	0.09	121.6	0.72	92.2	-62	192.9	1.43	160
GTR308	29113	10671.	0.	0.	-10671.	2378.	11539.	126.	970.	7.60	0.14	0.23	259.9	1.55	83.1	0	281.2	2.09	130
GTR312	29113	4366.	0.	0.	-4366.	309.	4613.	126.	126.	4.27	0.14	0.11	123.2	0.73	96.3	-59	187.8	1.40	162
GTR312	29113	9571.	0.	0.	-9571.	2353.	11455.	126.	959.	7.59	0.14	0.31	261.4	1.56	93.2	0	240.5	1.79	132
GTR316	29113	4369.	0.	0.	-4369.	309.	4613.	126.	126.	4.31	0.14	0.11	124.8	0.74	97.5	-61	186.1	1.40	162
GTR316	29113	9486.	0.	0.	-9436.	2311.	11315.	126.	942.	7.79	0.14	0.30	269.4	1.61	96.9	0	241.6	1.80	131
FCPADS	29113	4184.	0.	0.	-4434.	309.	4613.	126.	126.	17.46	0.14	0.09	170.6	1.02	129.8	999	210.6	1.57	155
FCPADS	29113	17894.	0.	0.	-17894.	4887.	19941.	126.	1993.	219.61	0.14	0.28	1007.8	6.01	192.2	0	647.3	4.81	180
FCMCDS	29113	4336.	0.	0.	-4336.	309.	4613.	126.	126.	16.62	0.14	0.12	175.4	1.05	138.1	0	204.5	1.52	157
FCMCDS	29113	13056.	0.	0.	-13056.	3866.	16522.	126.	1576.	163.96	0.14	0.36	880.1	5.25	230.0	0	473.4	3.52	159

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQ/L	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	33121	0.	147.	602.	0.	0.	0.	A	60.	0.	0.65	2.20	0.	7.4	1.00	230.9	0	18.5	1.00	80
STM141	33121	0.	261.	468.	0.	-114.	134.		60.	3.	0.45	2.20	0.03	5.4	0.73	152.1	-12	18.7	1.01	106
STM141	33121	0.	140.	589.	0.	7.	13.	F	60.	3.	0.80	2.20	0.03	10.8	1.46	302.9	7	18.4	1.00	88
STM141	33121	0.	140.	589.	0.	7.	13.	A	60.	3.	0.70	2.20	0.03	8.5	1.15	238.7	27	18.0	0.98	94
STM088	33121	0.	259.	479.	0.	-112.	123.		60.	2.	0.42	2.20	0.01	4.6	0.63	136.7	-13	18.8	1.02	105
STM088	33121	0.	143.	595.	0.	4.	7.	F	60.	2.	0.76	2.20	0.01	9.8	1.33	289.3	3	18.5	1.00	86
STM088	33121	0.	143.	595.	0.	4.	7.	A	60.	2.	0.67	2.20	0.01	7.9	1.07	233.3	30	18.2	0.99	90
PFBSTM	33121	0.	132.	577.	0.	16.	25.		60.	6.	1.00	2.20	0.05	13.8	1.86	344.8	7	18.3	0.99	92
TISTMT	33121	0.	272.	419.	0.	-125.	183.		60.	9.	1.09	2.20	0.08	30.3	4.09	704.0	0	21.1	1.14	90
TISTMT	33121	0.	125.	565.	0.	22.	37.		60.	9.	1.53	2.20	0.08	38.7	5.22	899.2	0	20.9	1.13	87
TIHRSG	33121	0.	283.	441.	0.	-136.	161.		60.	6.	0.98	2.20	0.03	29.8	4.02	671.8	0	21.7	1.17	82
TIHRSG	33121	0.	132.	593.	0.	15.	9.		60.	6.	1.43	2.20	0.03	38.3	5.18	865.4	0	21.6	1.17	79
STIRL	33121	187.	116.	389.	-187.	31.	213.		60.	13.	0.57	2.20	0.08	10.5	1.42	191.5	0	19.5	1.05	109
STIRL	33121	0.	303.	389.	0.	-156.	213.		60.	13.	0.57	2.20	0.08	10.5	1.42	191.7	6	18.4	1.00	108
STIRL	33121	0.	116.	576.	0.	31.	26.		60.	13.	1.01	2.20	0.08	17.9	2.42	327.9	10	17.8	0.96	96
HEGT60	33121	0.	62.	666.	0.	86.	-64.	A	60.	35.	2.28	2.20	0.03	61.4	8.29	455.3	0	21.9	1.19	92
HEGT00	33121	0.	122.	606.	0.	25.	-4.	A	60.	10.	1.11	2.20	0.03	26.7	3.60	460.9	0	19.6	1.06	84
FCNCCL	33121	0.	104.	546.	0.	43.	56.		60.	18.	1.50	2.20	0.13	30.7	4.15	531.2	4	18.6	1.01	100
FCSTCL	33121	0.	92.	526.	0.	55.	76.		60.	22.	1.75	2.20	0.17	34.3	4.63	538.1	5	18.3	0.99	106
IGGTST	33121	0.	111.	573.	0.	36.	29.		60.	15.	1.25	2.20	0.09	28.1	3.79	473.7	3	18.9	1.02	94
GTSOAR	33121	0.	332.	329.	0.	-185.	273.		60.	20.	0.56	2.20	0.12	11.4	1.54	165.7	16	17.8	0.96	115
GTAC08	33121	0.	292.	376.	0.	-145.	227.		60.	14.	0.46	2.20	0.11	8.3	1.13	157.9	67	17.5	0.95	117
GTAC12	33121	0.	304.	345.	0.	-157.	257.		60.	18.	0.50	2.20	0.13	9.7	1.30	164.0	36	17.3	0.93	119
GTAC16	33121	0.	316.	322.	0.	-168.	280.		60.	21.	0.55	2.20	0.15	11.1	1.50	172.3	26	17.2	0.93	119
OTWC16	33121	0.	325.	319.	0.	-177.	283.		60.	21.	0.56	2.20	0.14	11.3	1.52	167.6	23	17.4	0.94	118
CC1626	33121	0.	354.	258.	0.	-207.	344.		60.	29.	0.75	2.20	0.18	13.7	1.85	168.7	18	17.1	0.92	122
CC1622	33121	0.	338.	282.	0.	-190.	320.		60.	26.	0.71	2.20	0.17	12.9	1.74	173.2	19	17.1	0.93	121
CC1222	33121	0.	336.	284.	0.	-188.	318.		60.	25.	0.70	2.20	0.17	12.2	1.65	165.8	22	17.1	0.92	122
CC0822	33121	0.	311.	330.	0.	-163.	272.		60.	20.	0.64	2.20	0.14	10.5	1.42	169.0	26	17.3	0.94	120
DEADV3	33121	0.	548.	5.	0.	-400.	597.		60.	59.	1.46	2.20	0.26	40.1	5.42	250.8	3	19.2	1.04	123
DEHTPM	33121	0.	319.	340.	0.	-171.	262.		60.	19.	0.80	2.20	0.12	17.0	2.29	267.2	4	18.6	1.01	108
DESOA3	33121	586.	0.	0.	-586.	147.	602.		60.	60.	1.87	2.20	0.22	51.1	6.91	298.1	0	24.8	1.34	134
DESOA3	33121	682.	0.	0.	-682.	177.	702.		60.	72.	1.99	2.20	0.22	59.8	8.08	299.3	0	26.8	1.45	125
DESOA3	33121	0.	586.	0.	0.	-438.	602.		60.	60.	1.87	2.20	0.22	51.1	6.91	298.1	0	21.5	1.17	130
DESOA3	33121	0.	682.	0.	0.	-505.	702.		60.	72.	1.99	2.20	0.22	59.8	8.08	299.3	0	23.0	1.25	120
GTSOAD	33121	205.	104.	349.	-205.	43.	253.		60.	18.	0.48	2.20	0.12	8.8	1.19	146.4	4	18.5	1.00	121
GTRA08	33121	313.	67.	224.	-313.	80.	378.		60.	33.	0.71	2.20	0.19	16.0	2.16	174.6	1	18.8	1.02	124
GTRA12	33121	297.	71.	237.	-297.	76.	365.		60.	31.	0.70	2.20	0.19	15.8	2.13	181.3	2	18.7	1.01	124
GTRA16	33121	278.	77.	259.	-278.	70.	343.		60.	28.	0.69	2.20	0.18	15.7	2.12	192.2	1	18.8	1.02	121
GTR208	33121	244.	91.	305.	-244.	56.	297.		60.	23.	0.59	2.20	0.15	12.1	1.63	168.6	0	18.7	1.01	120
GTR212	33121	254.	87.	291.	-254.	60.	311.		60.	25.	0.61	2.20	0.16	13.0	1.76	175.0	0	18.7	1.01	121
GTR216	33121	256.	85.	285.	-256.	62.	317.		60.	25.	0.63	2.20	0.16	13.8	1.87	184.2	1	18.7	1.01	121
GTRW08	33121	374.	53.	177.	-374.	94.	425.		60.	38.	0.76	2.20	0.19	17.4	2.34	158.3	0	19.3	1.05	125

REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
GTRW12	33121	358.	54.	179.	-358.	94.	423.	60.	38.	0.75	2.20	0.21	17.2	2.33	164.3	0	18.9	1.02	126
GTRW16	33121	330.	62.	209.	-330.	85.	393.	60.	35.	0.74	2.20	0.20	16.9	2.28	174.0	0	18.9	1.03	124
GTR308	33121	318.	76.	256.	-318.	71.	347.	60.	29.	0.66	2.20	0.13	13.9	1.87	148.7	0	19.6	1.06	119
GTR312	33121	290.	76.	254.	-290.	71.	348.	60.	29.	0.65	2.20	0.17	13.9	1.87	163.1	0	18.8	1.02	123
GTR316	33121	288.	77.	258.	-288.	70.	344.	60.	29.	0.65	2.20	0.17	14.3	1.94	170.2	0	18.9	1.02	122
FCPADS	33121	540.	0.	0.	-540.	147.	602.	60.	60.	5.62	2.20	0.28	36.3	4.90	229.1	0	25.6	1.39	146
FCPADS	33121	547.	0.	0.	-547.	149.	610.	60.	61.	5.64	2.20	0.28	36.8	4.98	229.9	0	25.7	1.39	135
FCMCDS	33121	399.	29.	97.	-399.	118.	505.	60.	48.	4.26	2.20	0.30	31.4	4.25	268.9	0	22.6	1.22	135

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	33251	0.	687.	2842.	0.	0.	0.	F	280.	0.	2.64	1.05	0.	53.1	1.00	168.8	0	88.3	1.00	80
STM141	33251	0.	1276.	2056.	0.	-590.	787.		280.	30.	1.41	1.05	0.06	31.6	0.60	90.6	999	85.6	0.97	120
STM141	33251	0.	614.	2718.	0.	73.	124.	F	280.	30.	3.13	1.05	0.06	62.1	1.17	177.9	31	83.8	0.95	102
STM141	33251	0.	614.	2718.	0.	73.	124.	A	280.	30.	2.78	1.05	0.06	42.3	0.80	121.0	999	81.3	0.92	111
STM088	33251	0.	1256.	2166.	0.	-569.	677.		280.	16.	1.31	1.05	0.03	28.1	0.53	84.3	-1	87.2	0.99	116
STM083	33251	0.	647.	2774.	0.	40.	68.	F	280.	16.	2.92	1.05	0.03	57.6	1.08	172.6	34	85.8	0.97	96
STM088	33251	0.	647.	2774.	0.	40.	68.	A	280.	16.	2.67	1.05	0.03	40.1	0.75	120.2	999	83.7	0.95	105
FFBSTM	33251	0.	534.	2599.	0.	153.	243.		280.	62.	4.80	1.05	0.11	62.0	1.17	157.8	54	79.1	0.90	115
TISTMT	33251	0.	1306.	1930.	0.	-620.	912.		280.	45.	3.78	1.05	0.08	113.0	2.13	306.3	0	94.4	1.07	99
TISTMT	33251	0.	469.	2482.	0.	217.	360.		280.	89.	6.99	1.05	0.16	211.4	3.98	500.8	3	92.1	1.04	106
TIHRSG	33251	0.	1362.	2045.	0.	-675.	798.		280.	31.	3.60	1.05	0.03	111.7	2.10	297.7	0	97.9	1.11	91
TIHRSG	33251	0.	537.	2750.	0.	150.	92.		280.	61.	6.88	1.05	0.07	210.7	3.97	485.0	0	99.6	1.13	93
STIRL	33251	928.	533.	1784.	-928.	154.	1059.		280.	63.	2.58	1.05	0.08	65.9	1.24	154.2	0	93.3	1.06	114
STIRL	33251	0.	1460.	1784.	0.	-774.	1059.		280.	63.	2.58	1.05	0.08	65.9	1.24	154.4	6	88.2	1.00	112
STIRL	33251	0.	383.	2584.	0.	304.	259.		280.	124.	6.16	1.05	0.16	167.2	3.15	311.6	9	82.5	0.93	110
HEGT60	33251	0	0.	3355.	0.	687.	-512.	A	280.	280.	11.27	1.05	0.05	279.5	5.27	245.6	5	89.0	1.01	107
HEGT60	33251	0.	0.	3982.	0.	840.	-627.	A	280.	342.	13.86	1.05	0.05	376.5	7.09	284.8	1	101.3	1.15	97
HEGT00	33251	0.	442.	2866.	0.	245.	-44.	A	280.	100.	5.53	1.05	0.06	134.2	2.53	236.4	7	86.4	0.98	99
FCMCCL	33251	0.	264.	2818.	0.	423.	24.		280.	172.	8.67	1.05	0.13	160.3	3.02	282.7	9	81.6	0.92	109
FCSTCL	33251	0.	147.	2627.	0.	539.	215.		280.	220.	9.73	1.05	0.21	179.1	3.37	286.5	11	75.3	0.85	118
IGGTST	33251	0.	329.	3087.	0.	357.	-245.		280.	146.	4.63	1.05	0.03	142.1	2.68	244.2	9	83.1	0.94	98
GTSOAR	33251	0.	1607.	1488.	0.	-920.	1355.		280.	99.	2.26	1.05	0.12	55.1	1.04	111.2	999	83.1	0.94	125
GTAC08	33251	0.	1408.	1717.	0.	-722.	1125.		280.	71.	1.97	1.05	0.11	45.5	0.86	108.9	999	82.5	0.93	125
GTAC12	33251	0.	1466.	1566.	0.	-779.	1276.		280.	89.	2.13	1.05	0.14	51.2	0.96	114.3	999	81.1	0.92	128
GTAC16	33251	0.	1523.	1452.	0.	-837.	1391.		280.	103.	2.28	1.05	0.16	56.5	1.06	119.0	178	80.4	0.91	129
GTVC16	33251	0.	1568.	1435.	0.	-882.	1407.		280.	105.	2.22	1.05	0.15	53.8	1.01	109.9	999	80.7	0.91	129
CC1626	33251	0.	2711.	0.	0.	-2024.	2842.		280.	280.	3.09	1.05	0.23	86.4	1.63	108.6	22	78.5	0.89	145
CC1626	33251	0.	1716.	1130.	0.	-1029.	1713.		280.	142.	2.60	1.05	0.19	61.4	1.16	109.8	63	78.3	0.89	134
CC1	33251	0.	1633.	1252.	0.	-947.	1590.		280.	127.	2.57	1.05	0.18	62.2	1.17	118.8	53	79.3	0.90	131
CC	33251	0.	1623.	1262.	0.	-937.	1581.		280.	126.	2.53	1.05	0.18	59.6	1.12	114.5	73	79.0	0.89	132
CC0822	33251	0.	1499.	1492.	0.	-812.	1351.		280.	98.	2.24	1.05	0.15	49.5	0.93	106.8	999	80.1	0.91	131
DEADV3	33251	0.	2603.	0.	0.	-1916.	2842.		280.	280.	6.14	1.05	0.26	198.4	3.74	216.1	4	90.5	1.03	138
DEADV3	33251	0.	2713.	0.	0.	-1990.	2965.		280.	295.	6.37	1.05	0.26	207.3	3.90	218.1	2	92.1	1.04	127
DEHTPM	33251	0.	1538.	1542.	0.	-851.	1301.		280.	92.	3.49	1.05	0.13	97.2	1.83	206.4	5	88.4	1.00	114
DESOA3	33251	2766.	0.	0.	-2766.	687.	2842.		280.	280.	7.31	1.05	0.22	244.0	4.60	252.7	0	115.7	1.31	137
DESOA3	33251	3390.	0.	0.	-3390.	880.	3488.		280.	359.	8.85	1.05	0.22	303.5	5.72	264.2	0	130.0	1.47	128
DESOA3	33251	0.	2766.	0.	0.	-2079.	2842.		280.	280.	7.31	1.05	0.22	244.0	4.60	252.7	0	100.5	1.14	133
DESOA3	33251	0.	3390.	0.	0.	-2510.	3488.		280.	359.	8.85	1.05	0.22	303.5	5.72	264.2	0	111.3	1.26	123
GTSOAD	33251	1016.	473.	1585.	-1016.	213.	1257.		280.	87.	2.04	1.05	0.13	47.2	0.89	104.2	999	87.2	0.99	130
GTRA08	33251	2676.	0.	0.	-2676.	687.	2842.		280.	280.	3.61	1.05	0.24	107.8	2.03	130.8	0	95.0	1.08	146
GTRA08	33251	1555.	288.	963.	-1555.	399.	1880.		280.	163.	2.92	1.05	0.20	79.3	1.49	129.8	6	88.0	1.00	133
GTRA12	33251	2669.	0.	0.	-2669.	687.	2842.		280.	280.	3.59	1.05	0.24	108.2	2.04	133.9	0	94.7	1.07	146
GTRA12	33251	1474.	307.	1029.	-1474.	379.	1813.		280.	155.	2.85	1.05	0.20	76.9	1.45	131.0	8	87.3	0.99	133

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
GTRA16	33251	1382.	340.	1138.	-1382.	347.	1704.	280.	141.	2.82	1.05	0.19	76.4	1.44	136.5	6	87.9	1.00	131
GTR208	33251	1212.	408.	1366.	-1212.	279.	1477.	280.	114.	2.34	1.05	0.15	58.3	1.10	114.2	16	87.6	0.99	130
GTR212	33251	1261.	388.	1297.	-1261.	299.	1545.	280.	122.	2.43	1.05	0.17	61.5	1.16	117.1	14	87.4	0.99	131
GTR216	33251	1271.	379.	1268.	-1271.	308.	1574.	280.	126.	2.52	1.05	0.17	64.9	1.22	123.1	12	87.2	0.99	131
GTRW08	33251	2722.	0.	0.	-2722.	687.	2842.	280.	280.	3.35	1.05	0.23	94.4	1.78	107.4	0	94.6	1.07	147
GTRW08	33251	1859.	218.	729.	-1859.	469.	2113.	280.	191.	2.98	1.05	0.21	80.4	1.51	114.9	0	89.9	1.02	134
GTRW12	33251	2625.	0.	0.	-2625.	687.	2842.	280.	280.	3.33	1.05	0.26	94.1	1.77	110.9	0	91.7	1.04	150
GTRW12	33251	1778.	222.	742.	-1778.	465.	2101.	280.	190.	2.96	1.05	0.22	79.9	1.51	118.2	6	87.8	0.99	136
GTRW16	33251	2676.	0.	0.	-2676.	687.	2842.	280.	280.	3.36	1.05	0.24	96.8	1.82	115.3	0	93.5	1.06	148
GTRW16	33251	1642.	265.	889.	-1642.	421.	1954.	280.	172.	2.72	1.05	0.21	70.9	1.34	111.4	10	87.2	0.99	136
GTR308	33251	3082.	0.	0.	-3082.	687.	2842.	280.	280.	3.04	1.05	0.13	88.9	1.67	98.0	0	104.5	1.18	139
GTR308	33251	1579.	335.	1121.	-1579.	352.	1721.	280.	143.	2.50	1.05	0.14	62.4	1.18	101.1	0	91.5	1.04	130
GTR312	33251	2793.	0.	0.	-2793.	687.	2842.	280.	280.	3.01	1.05	0.21	87.9	1.66	106.6	0	95.7	1.08	146
GTR312	33251	1441.	333.	1113.	-1441.	354.	1729.	280.	144.	2.47	1.05	0.18	62.1	1.17	107.5	15	87.0	0.99	135
GTR316	33251	2818.	0.	0.	-2818.	687.	2842.	280.	280.	2.99	1.05	0.20	90.4	1.70	109.5	0	96.7	1.10	145
GTR316	33251	1429.	339.	1134.	-1429.	348.	1709.	280.	142.	2.50	1.05	0.18	63.3	1.19	110.3	11	87.5	0.99	134
FCPADS	33251	2555.	0.	0.	-2555.	687.	2842.	280.	280.	25.99	1.05	0.28	177.7	3.35	196.5	0	121.1	1.37	150
FCPADS	33251	2718.	0.	0.	-2718.	742.	3028.	280.	303.	27.97	1.05	0.28	189.7	3.57	199.4	0	125.7	1.42	140
FCMCDS	33251	2319.	0.	0.	-2319.	687.	2842.	280.	280.	24.59	1.05	0.34	188.0	3.54	232.8	0	113.7	1.29	155
FCMCDS	33251	1983.	99.	333.	-1983.	587.	2509.	280.	239.	21.25	1.05	0.32	165.5	3.12	224.8	0	108.4	1.23	141

HONEYWELL PAGE PRINTING SYSTEM— P1185-02

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

ECS	PROCS	FUEL USE IN BTU*10**6 – **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCON	33254	0.	98.	435.	0.	0.	0.	A	40.	0.	0.64	1.50	0.	7.3	1.00	233.0	0	13.3	1.00	80
STM141	33254	0.	210.	304.	0.	-112.	131.		40.	3.	0.44	1.50	0.04	5.3	0.73	153.4	-12	13.5	1.02	110
STM141	33254	0.	91.	423.	0.	7.	12.	F	40.	3.	0.79	1.50	0.04	10.6	1.45	304.9	7	13.2	0.99	92
STM141	33254	0.	91.	423.	0.	7.	12.	A	40.	3.	0.69	1.50	0.04	8.4	1.15	240.8	27	12.8	0.97	97
STM088	33254	0.	208.	315.	0.	-110.	120.		40.	2.	0.42	1.50	0.02	4.6	0.63	137.8	-12	13.6	1.02	108
STM088	33254	0.	94.	429.	0.	4.	7.	F	40.	2.	0.76	1.50	0.02	9.7	1.32	291.2	3	13.3	1.00	89
STM088	33254	0.	94.	429.	0.	4.	7.	A	40.	2.	0.67	1.50	0.02	7.8	1.07	235.4	30	13.0	0.98	93
PFBSTM	33254	0.	83.	411.	0.	15.	24.		40.	6.	0.99	1.50	0.07	13.6	1.86	347.5	7	13.1	0.99	98
TISTMT	33254	0.	220.	256.	0.	-122.	179.		40.	9.	1.08	1.50	0.11	29.8	4.08	708.0	0	15.8	1.19	99
TISTMT	33254	0.	76.	400.	0.	22.	36.		40.	9.	1.51	1.50	0.11	38.1	5.21	904.4	0	15.7	1.18	96
TIHRSG	33254	0.	231.	278.	0.	-133.	157.		40.	6.	0.97	1.50	0.05	29.3	4.01	675.6	0	16.4	1.24	89
TIHRSG	33254	0.	83.	426.	0.	15.	9.		40.	6.	1.41	1.50	0.05	37.7	5.16	870.4	0	16.3	1.23	86
STIRL	33254	183.	68.	227.	-183.	30.	209.		40.	12.	0.56	1.50	0.11	10.3	1.40	191.7	0	14.2	1.07	116
STIRL	33254	0.	251.	227.	0.	-152.	209.		40.	12.	0.56	1.50	0.11	10.3	1.41	191.9	6	13.2	1.00	116
STIRL	33254	0.	68.	410.	0.	30.	26.		40.	12.	0.99	1.50	0.11	17.6	2.41	329.2	10	12.6	0.95	104
HEGT60	33254	0.	14.	498.	0.	84.	-63.	A	40.	34.	2.25	1.50	0.04	60.4	8.27	456.2	0	16.7	1.26	97
HEGT00	33254	0.	74.	440.	0.	24.	-4.	A	40.	10.	1.09	1.50	0.04	26.3	3.59	463.9	0	14.4	1.09	90
FCMCCL	33254	0.	56.	380.	0.	42.	55.		40.	17.	1.48	1.50	0.18	30.2	4.14	534.5	4	13.4	1.01	111
FCSTCL	33254	0.	44.	361.	0.	54.	74.		40.	22.	1.72	1.50	0.24	33.8	4.62	541.5	5	13.1	0.99	118
IGGTST	33254	0.	63.	407.	0.	36.	28.		40.	15.	1.23	1.50	0.12	27.7	3.78	477.1	3	13.7	1.03	103
GTSOAR	33254	0.	279.	169.	0.	-181.	267.		40.	19.	0.56	1.50	0.16	11.2	1.53	166.7	16	12.6	0.95	124
GTAC08	33254	0.	240.	214.	0.	-142.	222.		40.	14.	0.46	1.50	0.15	8.2	1.12	158.9	69	12.3	0.93	126
GTAC12	33254	0.	252.	184.	0.	-154.	251.		40.	18.	0.50	1.50	0.18	9.5	1.30	164.9	37	12.1	0.91	129
GTAC16	33254	0.	263.	162.	0.	-165.	274.		40.	20.	0.54	1.50	0.20	10.9	1.49	173.2	26	12.0	0.90	130
GTWC16	33254	0.	272.	158.	0.	-174.	277.		40.	21.	0.55	1.50	0.19	11.1	1.52	168.6	23	12.2	0.92	128
CC1626	33254	0.	301.	98.	0.	-203.	337.		40.	28.	0.74	1.50	0.25	13.5	1.85	169.8	18	11.9	0.90	133
CC1622	33254	0.	284.	123.	0.	-186.	313.		40.	25.	0.70	1.50	0.24	12.6	1.73	174.1	19	12.0	0.90	132
CC1222	33254	0.	283.	124.	0.	-184.	311.		40.	25.	0.69	1.50	0.24	12.0	1.64	166.7	22	11.9	0.90	133
CC0822	33254	0.	258.	170.	0.	-160.	266.		40.	19.	0.63	1.50	0.20	10.3	1.41	170.0	26	12.1	0.91	130
DEADV3	33254	0.	401.	0.	0.	-303.	435.		40.	40.	1.28	1.50	0.25	29.2	3.99	248.1	1	14.1	1.07	136
DEADV3	33254	0.	534.	0.	0.	-392.	584.		40.	58.	1.43	1.50	0.26	39.3	5.38	251.0	0	15.8	1.19	126
DEHTPM	33254	0.	266.	179.	0.	-168.	256.		40.	18.	0.79	1.50	0.17	16.6	2.28	267.5	4	13.4	1.01	118
DESOA3	33254	424.	0.	0.	-424.	98.	435.		40.	40.	1.47	1.50	0.20	35.9	4.91	288.7	0	17.9	1.35	136
DESOA3	33254	668.	0.	0.	-668.	173.	687.		40.	71.	1.95	1.50	0.22	58.6	8.01	299.4	0	23.3	1.76	130
DESOA3	33254	0.	424.	0.	0.	-326.	435.		40.	40.	1.47	1.50	0.20	35.9	4.91	288.7	0	15.6	1.[illegible]8	131
DESOA3	33254	0.	668.	0.	0.	-494.	687.		40.	71.	1.95	1.50	0.22	58.6	8.01	299.[illegible]	[illegible]	19.7	1.48	123
GTSOAD	33254	200.	56.	168.	-200.	42.	248.		40.	17.	0.48	1.50	0.17	8.6	1.18	147.[illegible]	[illegible]	13.3	1.00	131
GTRA08	33254	306.	19.	65.	-306.	79.	370.		40.	32.	0.70	1.50	0.27	15.8	2.16	175.[illegible]	[illegible]	13.6	1.02	136
GTRA12	33254	290.	23.	78.	-290.	75.	357.		40.	30.	0.69	1.50	0.27	15.5	2.12	182.3	[illegible]	13.5	1.01	135
GTRA16	33254	272.	30.	100.	-272.	68.	336.		40.	28.	0.68	1.50	0.25	15.4	2.11	193.3	[illegible]	13.6	1.02	133
GTR208	33254	239.	43.	145.	-239.	55.	291.		40.	22.	0.58	1.50	0.20	11.9	1.62	169.5	0	13.5	1.02	131
GTR212	33254	248.	39.	131.	-248.	59.	304.		40.	24.	0.60	1.50	0.22	12.8	1.75	176.0	0	13.5	1.02	132
GTR216	33254	250.	37.	125.	-250.	61.	310.		40.	25.	0.62	1.50	0.23	13.6	1.86	185.2	1	13.5	1.02	132

		FUEL USE IN BTU*10**6																
		COGENERATION CASE			**NOCOGEN - COGEN**													
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG WRTH
GTRW08	33254	366.	6.	19.	-366.	92.	416.	40.	38.	0.75	1.50	0.27	17.1	2.34	159.3	0	14.1	1.06 136
GTRW12	33254	350.	6.	22.	-350.	92.	414.	40.	37.	0.75	1.50	0.29	17.0	2.32	165.3	0	13.7	1.03 138
GTRW16	33254	323.	15.	51.	-323.	83.	385.	40.	34.	0.73	1.50	0.27	16.6	2.27	175.2	0	13.7	1.[illegible] 136
GTR308	33254	311.	29.	96.	-311.	69.	339.	40.	28.	0.65	1.50	0.18	13.6	1.86	149.6	0	14.4	1.09 129
GTR312	33254	284.	28.	95.	-284.	70.	341.	40.	28.	0.64	1.50	0.24	13.6	1.87	164.1	0	13.5	1.02 134
GTR316	33254	281.	30.	99.	-281.	69.	337.	40.	28.	0.65	1.50	0.23	14.1	1.93	171.3	0	13.7	1.03 133
FCPADS	33254	394.	0.	0.	-394.	98.	435.	40.	40.	3.96	1.50	0.26	26.2	3.59	227.0	0	18.5	1.40 148
FCPADS	33254	535.	0.	0.	-535.	146.	597.	40.	60.	5.52	1.50	0.28	35.8	4.90	228.4	0	22.3	1.68 141
FCMCDS	33254	348.	0.	0.	-348.	98.	435.	40.	40.	3.71	1.50	0.35	27.4	3.75	269.1	0	17.0	1.28 155
FCMCDS	33254	391.	0.	0.	-391.	116.	494.	40.	47.	4.17	1.50	0.36	30.8	4.22	269.3	0	18.0	1.36 146

DATE 06/07/79
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GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**															
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	33314	0.	25.	130.	0.	0.	0.	A	10.	0.	0.45	0.86	0.	4.6	1.00	330.6	0	4.7	1.00	80
STM141	33314	0.	75.	65.	0.	-50.	65.		10.	2.	0.34	0.86	0.09	3.6	0.79	221.1	999	4.6	0.99	124
STM141	33314	0.	20.	121.	0.	5.	9.	F	10.	2.	0.57	0.86	0.09	6.6	1.44	402.4	10	4.5	0.97	109
STM141	33314	0.	20.	121.	0	5.	9.	A	10.	2.	0.50	0.86	0.09	5.6	1.23	343.1	23	4.3	0.93	112
STM088	33314	0.	74.	71.	0.	-49.	59.		10.	2.	0.32	0.86	0.06	3.1	0.68	199.0	-4	4.6	1.00	122
STM088	33314	0.	21.	124.	0.	4.	6.	F	10.	2.	0.54	0.86	0.06	6.0	1.31	385.1	9	4.6	0.98	104
STM088	33314	0.	21.	124.	0.	4.	6.	A	10.	2.	0.48	0.86	0.06	5.2	1.15	336.8	24	4.4	0.95	107
PFBSTM	33314	0.	16.	115.	0.	9.	15.		10.	4.	0.66	0.86	0.15	8.6	1.89	472.4	8	4.5	0.96	116
TISTMT	33314	0.	80.	43.	0.	-55.	87.		10.	5.	0.70	0.86	0.21	17.3	3.80	878.3	0	6.0	1.28	123
TISTMT	33314	0.	13.	110.	0.	12.	20.		10.	5.	0.98	0.86	0.21	22.1	4.85	1119.7	0	6.0	1.28	120
TIHRSG	33314	0.	80.	62.	0.	-56.	68.		10.	3.	0.56	0.86	0.08	15.4	3.38	849.8	0	6.1	1.31	102
TIHRSG	33314	0.	19.	124.	0.	6.	6.		10.	3.	0.82	0.86	0.08	19.9	4.36	1096.9	0	6.2	1.33	99
STIRL	33314	84.	10.	32.	-84.	15.	98.		10.	6.	0.35	0.86	0.19	5.0	1.09	201.3	0	4.9	1.04	140
STIRL	33314	0.	93.	32.	0.	-69.	98.		10.	6.	0.35	0.86	0.19	5.0	1.09	201.6	61	4.3	0.93	137
STIRL	33314	0.	10.	116.	0.	15.	14.		10.	6.	0.61	0.86	0.19	8.4	1.84	341.6	16	4.0	0.85	123
HEGT85	33314	0.	0.	139.	0.	25.	-9.	A	10.	10.	1.34	0.86	0.10	29.6	6.48	725.0	0	6.8	1.45	123
HEGT85	33314	0.	0.	330.	0.	76.	-28.	A	10.	31.	2.06	0.86	0.13	56.8	12.46	587.6	0	9.8	2.11	112
HEGT60	33314	0.	0.	134.	0.	25.	-4.	A	10.	10.	1.11	0.86	0.13	26.1	5.73	663.5	0	6.1	1.31	124
HEGT60	33314	0.	0.	137.	0.	25.	-4.	A	10.	10.	1.03	0.86	0.13	26.1	5.73	651.9	0	6.0	1.29	113
HEGT00	33314	0.	14.	130.	0.	10.	-0.	A	10.	4.	0.64	0.86	0.07	14.3	3.14	597.7	0	5.2	1.12	102
FCMCCL	33314	0.	6.	106.	0.	18.	24.		10.	8.	0.87	0.86	0.28	16.9	3.70	680.5	3	4.8	1.04	129
FCSTCL	33314	0.	0.	95.	0.	25.	35.		10.	10.	1.18	0.86	0.38	19.9	4.36	712.5	4	4.9	1.05	152
FCSTCL	33314	0.	0.	100.	0.	27.	38.		10.	11.	1.08	0.86	0.39	20.0	4.39	685.8	4	4.7	1.02	141
IGGTST	33314	0.	6.	113.	0.	19.	17.		10.	8.	0.86	0.86	0.23	17.0	3.74	627.2	3	5.0	1.07	123
GTSOAR	33314	0.	99.	17.	0.	-75.	113.		10.	8.	0.35	0.86	0.25	6.0	1.32	213.6	24	4.2	0.90	141
GTAC08	33314	0.	87.	32.	0.	-63.	98.		10.	6.	0.30	0.86	0.23	4.6	1.01	201.9	999	4.1	0.88	142
GTAC12	33314	0.	92.	20.	0.	-67.	110.		10.	8.	0.32	0.86	0.28	5.2	1.14	205.4	72	4.0	0.85	146
GTAC16	33314	0.	96.	11.	0.	-71.	119.		10.	9.	0.34	0.86	0.31	5.8	1.28	215.3	35	3.9	0.84	148
GTWC16	33314	0.	101.	8.	0.	-75.	122.		10.	9.	0.36	0.86	0.29	6.3	1.37	216.3	27	4.0	0.87	145
CC1626	33314	0.	105.	0.	0.	-80.	130.		10.	10.	0.59	0.86	0.32	7.4	1.62	240.2	13	4.3	0.92	157
CC1626	33314	0.	127.	0.	0.	-93.	161.		10.	14.	0.52	0.86	0.35	8.1	1.79	218.7	12	4.3	0.91	146
CC1622	33314	0.	103.	0.	0.	-78.	130.		10.	10.	0.57	0.86	0.34	7.0	1.54	233.5	17	4.2	0.90	159
CC1622	33314	0.	116.	0.	0.	-85.	150.		10.	12.	0.49	0.86	0.36	7.4	1.62	217.6	17	4.1	0.88	149
CC1222	33314	0.	102.	0.	0.	-78.	130.		10.	10.	0.56	0.86	0.34	6.7	1.48	224.9	19	4.1	0.89	160
CC1222	33314	0.	115.	0.	0.	-85.	149.		10.	12.	0.49	0.86	0.36	7.0	1.54	208.9	20	4.0	0.86	150
CC0822	33314	0.	98.	2.	0.	-73.	128.		10	10.	0.45	0.86	0.35	6.3	1.37	220.1	29	3.9	0.84	152
STIG15	33314	0.	136.	0.	0.	-111.	130.		10.	10.	0.65	0.86	0.12	7.9	1.74	196.8	0	5.3	1.13	136
STIG15	33314	0.	3077.	0.	0.	-2234.	2868.		10.	344.	5.82	0.86	0.17	99.7	21.88	110.6	0	43.0	9.21	269
STIG10	33314	0.	128.	0.	0.	-103.	130.		10.	10.	0.59	0.86	0.17	7.3	1.61	195.2	0	4.9	1.05	142
STIG10	33314	0.	302.	0.	0.	-224.	308.		10.	32.	0.79	0.86	0.22	12.9	2.83	145.9	0	6.7	1.44	120
STIG1S	33314	0.	124.	0.	0.	-100.	130.		10.	10.	0.58	0.86	0.20	7.0	1.53	191.7	1	4.8	1.02	145
STIG1S	33314	0.	190.	0.	0.	-144.	200.		10.	19.	0.58	0.86	0.23	8.8	1.94	159.1	0	5.3	1.13	132
DEADV3	33314	0.	117.	0.	0.	-93.	130.		10.	10.	0.63	0.86	0.24	9.8	2.15	285.1	0	4.9	1.06	145

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----------FUEL USE IN BTU*10**6-----------																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
DEADV3	33314	0.	194.	0.	0.	-143.	221.	10.	21.	0.68	0.86	0.29	14.8	3.25	260.5	0	5.7	1.22	131
DEHTPM	33314	0.	96.	9.	0.	-71.	121.	10.	9.	0.49	0.86	0.32	8.5	1.87	312.2	11	4.3	0.93	143
DESOA3	33314	125.	0.	0.	-123.	25.	130.	10.	10.	0.66	0.86	0.20	10.6	2.32	292.3	0	6.0	1.28	144
DESOA3	33314	233.	0.	0.	-233.	60.	249.	10.	25.	0.86	0.86	0.25	21.1	4.62	308.8	0	8.4	1.81	133
DESOA3	33314	0.	123.	0.	0.	-98.	130.	10.	10.	0.66	0.86	0.20	10.6	2.32	292.3	0	5.2	1.11	140
DESOA3	33314	0.	233	0.	0.	-172.	249.	10.	25.	0.86	0.86	0.25	21.1	4.62	308.8	0	7.0	1.50	125
GTSOAD	33314	87.	7.	22.	-87.	18.	108.	10.	7.	0.31	0.86	0.26	4.8	1.05	187.4	69	4.6	0.98	149
GTRA08	33314	105.	0.	0.	-105.	25.	130.	10.	10.	0.50	0.86	0.32	7.7	1.68	248.8	0	4.9	1.05	159
GTRA08	33314	119.	0.	0.	-119.	30.	149.	10.	12.	0.42	0.86	0.34	8.1	1.77	231.8	0	4.9	1.05	149
GTRA12	33314	104.	0.	0.	-104.	25.	130.	10.	10.	0.49	0.86	0.33	7.6	1.68	250.7	0	4.8	1.04	160
GTRA12	33314	115.	0.	0.	-115.	30.	146.	10.	12.	0.41	0.86	0.35	8.0	1.75	235.6	0	4.8	1.03	150
GTRA16	33314	104.	0.	0.	-104.	25.	130.	10.	10.	0.49	0.86	0.33	7.9	1.73	260.3	0	4.8	1.04	160
GTRA16	33314	110.	0.	0.	-110.	28.	140.	10.	11.	0.41	0.86	0.34	8.0	1.76	248.7	1	4.8	1.03	150
GTR208	33314	99.	2.	6.	-99.	23.	124.	10.	9.	0.36	0.86	0.30	6.4	1.39	218.3	6	4.6	1.00	149
GTR212	33314	103.	0.	1.	-103.	25.	129.	10.	10.	0.38	0.86	0.32	6.9	1.50	226.3	6	4.6	1.00	150
GTR216	33314	103.	0.	0.	-103.	25.	130.	10.	10.	0.43	0.86	0.33	7.2	1.59	239.9	4	4.7	1.01	161
GTR216	33314	104.	0.	0.	-104.	25.	131.	10.	10.	0.39	0.86	0.34	7.2	1.57	236.0	5	4.6	1.00	151
GTRW08	33314	113.	0.	0.	-113.	25.	130.	10.	10.	0.53	0.86	0.27	7.9	1.74	239.6	0	5.2	1.12	154
GTRW08	33314	144.	0.	0.	-144.	36.	169.	10.	15.	0.46	0.86	0.30	9.0	1.98	213.9	0	5.5	1.17	144
GTRW12	33314	110	0.	0.	-110.	25.	130.	10.	10.	0.52	0.86	0.29	7.9	1.74	246.2	0	5.1	1.09	156
GTRW12	33314	141.	0.	0.	-141.	37.	170.	10.	15.	0.46	0.86	0.32	9.1	1.99	220.0	0	5.3	1.14	146
GTRW16	33314	109.	0.	0.	[illegible]	25.	130.	10.	10.	0.52	0.86	0.29	8.2	1.79	254.7	0	5.1	1.09	156
GTRW16	33314	133.	0.	C.	[illegible]	34.	161.	10.	14.	0.45	0.86	0.32	9.0	1.98	231.7	0	5.3	1.13	146
GTR308	33314	116.	0.	0.	-116.	25.	130.	10.	10.	0.48	0.86	0.25	7.2	1.57	210.3	0	5.2	1.11	153
GTR308	33314	124.	0.	0.	-124.	28.	140.	10.	11.	0.40	0.86	0.26	7.2	1.58	197.9	0	5.2	1.11	143
GTR312	33314	109.	0.	0.	-109.	25.	130.	10.	10.	0.49	0.86	0.30	7.3	1.61	230.3	0	4.9	1.06	158
GTR312	33314	121.	0.	0.	-121.	30.	146.	10.	12.	0.41	0.86	0.31	7.5	1.66	213.6	0	5.0	1.06	148
GTR316	33314	109.	0.	0.	-109.	25.	130.	10.	10.	0.49	0.86	0.30	7.6	1.67	239.1	0	5.0	1.07	157
GTR316	33314	120.	0.	0.	-120.	29.	145.	10.	12.	0.41	0.86	0.31	7.8	1.72	223.3	0	5.0	1.07	147
FCPADS	33314	120.	0.	0.	-120.	25.	130.	10.	10.	1.32	0.86	0.23	8.5	1.86	241.9	0	6.3	1.35	153
FCPADS	33314	235.	0.	0.	-235.	64.	262.	10.	26.	2.77	0.86	0.28	16.4	3.59	237.6	0	9.7	2.07	145
FCMCDS	33314	108.	0.	0.	-108.	25.	130.	10.	10.	1.24	0.86	0.30	8.6	1.88	272.0	0	5.8	1.25	160
FCMCDS	33314	172.	0.	0.	-172.	51.	217.	10.	21.	2.09	0.86	0.36	14.0	3.06	277.4	0	7.5	1.61	151

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		-----FUEL USE IN BTU*10**6----- **COGENERATION CASE**			**NOCOGEN - COGEN**																
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	33315	0.	45.	222.	0.	0.	0.	A	19.	0.	0.54	1.05	0.	5.7	1.00	277.9	0	7.7	1.00	80
STM141	33315	0.	121.	126.	0.	-76.	97.		19.	3.	0.39	1.05	0.08	4.6	0.80	188.7	-3	7.7	1.00	120
STM141	33315	0.	38.	209.	0.	8.	13.	F	19.	3.	0.68	1.05	0.08	8.6	1.50	353.7	11	7.5	0.96	104
STM141	33315	0.	38.	209.	0.	8.	13.	A	19.	3.	0.60	1.05	0.08	7.1	1.24	290.7	26	7.2	0.93	108
STM088	33315	0.	119.	134.	0.	-74.	89.		19.	2.	0.38	1.05	0.06	4.0	0.69	171.2	-7	7.8	1.01	118
STM088	33315	0.	40.	213.	0.	[illegible]	9.	F	19.	2.	0.65	1.05	0.06	7.9	1.38	339.2	10	7.6	0.98	100
STM088	33315	0.	40.	213.	0.	5.	9.	A	19.	2.	0.58	1.05	0.06	6.7	1.16	285.8	27	7.4	0.95	103
PFBSTM	33315	0.	32.	201.	0.	13.	22.		19.	5.	0.83	1.05	0.13	11.1	1.94	407.1	9	7.4	0.95	111
TISTMT	33315	0.	128.	92.	0.	-83.	131.		19.	7.	0.88	1.05	0.18	23.3	4.05	788.0	0	9.5	1.23	115
TISTMT	33315	0.	27.	193.	0.	18.	30.		19.	7.	1.24	1.05	0.18	29.7	5.16	1004.2	0	9.3	1.21	112
TIHRSG	33315	0.	123.	120.	0.	-84.	102.		19.	4.	0.72	1.05	0.07	20.8	3.61	763.0	0	9.8	1.27	97
TIHRSG	33315	0.	36.	213.	0.	9.	9.		19.	4.	1.05	1.05	0.07	26.8	4.66	984.2	0	9.7	1.26	94
STIRL	33315	126.	23.	76.	-126.	23.	147.		19.	9.	0.45	1.05	0.16	7.2	1.26	196.6	0	8.2	1.06	132
STIRL	33315	0.	148.	76.	0.	-103.	147.		19.	9.	0.45	1.05	0.16	7.3	1.26	196.9	19	7.4	0.96	129
STIRL	33315	0.	23.	201.	0.	23.	21.		19.	9.	0.80	1.05	0.16	13.1	2.27	354.6	12	6.9	0.89	116
HEGT85	33315	0.	0.	240.	0.	45.	-17.	A	19.	19.	1.87	1.05	0.10	44.1	7.67	627.5	0	10.5	1.36	119
HEGT85	33315	0.	0.	507.	0.	117.	-45.	A	19.	48.	2.78	1.05	0.12	77.1	13.40	518.1	0	14.1	1.83	109
HEGT60	33315	0.	7.	230.	0.	38.	-7.	A	19.	16.	1.35	1.05	0.12	34.9	6.07	576.9	0	9.3	1.20	108
HEGT00	33315	0.	30.	223.	0.	16.	-0.	A	19.	6.	0.83	1.05	0.06	19.1	3.32	530.2	0	8.4	1.09	97
FCMCCL	33315	0.	18.	186.	0.	28.	37.		19.	11.	1.14	1.05	0.24	22.4	3.90	604.0	5	7.8	1.01	121
FCSTCL	33315	0.	5.	166.	0.	40.	57.		19.	16.	1.41	1.05	0.36	26.6	4.63	608.9	6	7.4	0.95	135
IGGTST	33315	0.	18.	198.	0.	28.	25.		19.	11.	1.04	1.05	0.20	22.2	3.87	546.4	4	7.8	1.02	116
GTSOAR	33315	0.	157.	53.	0.	-112.	169.		19.	12.	0.43	1.05	0.21	8.0	1.40	193.5	22	7.1	0.92	134
GTAC08	33315	0.	139.	76.	0.	-94.	146.		19.	9.	0.37	1.05	0.20	6.1	1.07	179.6	149	7.0	0.90	136
GTAC12	33315	0.	146.	57.	0.	-101.	165.		19.	12.	0.40	1.05	0.24	7.0	1.22	184.6	50	6.8	0.88	140
GTAC16	33315	0.	152.	44.	0.	-107.	178.		19.	13.	0.43	1.05	0.27	7.9	1.37	194.2	33	6.7	0.87	141
GTWC16	33315	0.	160.	39.	0.	-115.	183.		19.	14.	0.44	1.05	0.25	8.3	1.45	191.5	26	6.8	0.89	139
CC1626	33315	0.	177.	0.	0.	-132.	222.		19.	19.	0.71	1.05	0.34	10.6	1.85	204.4	17	6.8	0.88	155
CC1626	33315	0.	190	0.	0.	-139.	241.		19.	21.	0.63	1.05	0.35	10.8	1.88	194.2	17	6.7	0.87	145
CC1622	33315	0.	173.	0.	0.	-127.	222.		19.	19.	0.64	1.05	0.36	10.1	1.75	198.7	21	6.5	0.84	158
CC1622	33315	0.	174.	0.	0.	-128.	224.		19.	19.	0.60	1.05	0.36	10.0	1.74	196.3	22	6.5	0.84	158
CC1222	33315	0.	172.	0.	0.	-126.	222.		19.	19.	0.62	1.05	0.36	9.6	1.66	189.7	24	6.4	0.83	159
CC1222	33315	0.	172.	0.	0.	-127.	223.		19.	19.	0.59	1.05	0.36	9.5	1.65	188.3	25	6.4	0.83	159
CC0822	33315	0.	155.	31.	0.	-109.	191.		19.	15.	0.54	1.05	0.31	8.3	1.45	195.6	29	6.6	0.85	144
STIG15	33315	0.	234.	0.	0.	-188.	222.		19.	19.	0.88	1.05	0.13	11.6	2.02	169.8	0	8.6	1.11	133
STIG15	33315	0.	4615.	0.	0.	-3351.	4302.		19.	515.	8.40	1.05	0.17	145.9	25.39	107.9	0	64.3	8.33	247
STIG10	33315	0.	219.	0.	0.	-174.	222.		19.	19.	0.79	1.05	0.18	10.7	1.86	166.8	0	8.0	1.03	140
STIG10	33315	0.	453.	0.	0.	-336.	462.		19.	48.	1.03	1.05	0.22	17.4	3.02	131.0	0	10.3	1.33	122
STIG1S	33315	0.	212.	0.	0.	-167.	222.		19.	19.	0.76	1.05	0.21	10.1	1.76	162.9	5	7.7	1.00	143
STIG1S	33315	0.	285.	0.	0.	-216.	300.		19.	26.	0.75	1.05	0.23	11.9	2.06	142.2	0	8.2	1.07	131
DEADV3	33315	0.	200.	0.	0.	-154.	222.		19.	19.	0.82	1.05	0.25	14.7	2.56	251.7	3	7.9	1.02	142
DEADV3	33315	0.	293.	0.	0.	-215.	332.		19.	32.	0.91	1.05	0.29	22.0	3.83	256.3	0	9.0	1.17	130
DEHTPM	33315	0.	152.	42.	0.	-107.	181.		19.	13.	0.60	1.05	0.27	11.1	1.93	270.7	12	7.1	0.93	136

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		----------FUEL USE IN BTU*10**6----------																		
		COGENERATION CASE			**NOCOGEN - COGEN**			POWER	COGEN	O&M	POWER	FESR	CAPITAL	NORM	$/KW	ROI	LEVL	NORM	WRTH
ECS	PROCS I	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	REQD MW	POWER MW		/HEAT RATIO		COST *10**6	COST	EQVL	(%)	CHRG	ENRG	
DESOA3	33315	210.	0.	0.	-210.	45.	222.	19.	19.	0.91	1.05	0.21	17.9	3.11	290.0	0	9.9	1.29	141
DESOA3	33315	351.	0.	0.	-351.	91.	375.	19.	37.	1.17	1.05	0.25	31.3	5.45	304.8	0	13.1	1.70	132
DESOA3	33315	0.	210.	0.	0.	-165.	222.	19.	19.	0.91	1.05	0.21	17.9	3.11	290.0	0	8.6	1.12	137
DESOA3	33315	0.	351.	0.	0.	-260.	375.	19.	37.	1.17	1.05	0.25	31.3	5.45	304.8	0	10.9	1.42	125
GTSOAD	33315	130.	18.	60.	-130.	27.	162.	19.	11.	0.38	1.05	0.22	6.4	1.11	167.0	17	7.6	0.99	142
GTRA08	33315	177.	0.	0.	-177.	45.	222.	19.	19.	0.57	1.05	0.34	10.8	1.88	208.4	5	7.7	1.00	158
GTRA08	33315	178.	0.	0.	-178.	46.	224.	19.	19.	0.52	1.05	0.34	10.8	1.87	206.0	5	7.7	1.00	158
GTRA12	33315	173.	1.	3.	-173.	45.	220.	19.	18.	0.52	1.05	0.34	10.7	1.86	210.8	6	7.6	0.99	147
GTRA16	33315	166.	4.	13.	-166.	42.	210.	19.	17.	0.52	1.05	0.32	10.8	1.88	222.3	5	7.7	1.00	145
GTR208	33315	149.	11.	37.	-149.	34.	185.	19.	14.	0.45	1.05	0.26	8.5	1.48	194.4	4	7.7	1.00	142
GTR212	33315	155.	9.	29.	-155.	37.	194.	19.	15.	0.47	1.05	0.28	9.2	1.59	201.6	5	7.7	1.00	143
GTR216	33315	156.	8.	26.	-156.	38.	197.	19.	15.	0.48	1.05	0.29	9.6	1.68	211.2	5	7.7	1.00	144
GTRW08	33315	192.	0.	0.	-192.	45.	222.	19.	19.	0.65	1.05	0.28	11.4	1.98	202.[illegible]	0	8.4	1.08	152
GTRW08	33315	216.	0.	0.	-216.	55.	253.	19.	22.	0.57	1.05	0.30	12.0	2.08	188.5	0	8.5	1.10	142
GTRW12	33315	186.	0.	0.	-186.	45.	222.	19.	19.	0.65	1.05	0.30	11.4	1.98	208.5	0	8.2	1.06	154
GTRW12	33315	212.	0.	0.	-212.	55.	256.	19.	23.	0.57	1.05	0.32	12.0	2.09	194.0	0	8.3	1.08	144
GTRW16	33315	185.	0.	0.	-185.	45.	222.	19.	19.	0.64	1.05	0.31	11.6	2.03	214.9	0	8.2	1.06	154
GTRW16	33315	200.	0.	0.	-200.	51.	242.	19.	21.	0.56	1.05	0.32	11.9	2.08	204.1	0	8.2	1.08	144
GTR308	33315	187.	4.	12.	-187.	42.	210.	19.	17.	0.50	1.05	0.24	9.6	1.67	175.6	0	8.3	1.08	139
GTR312	33315	181.	1.	3.	-181.	44.	220.	19.	18.	0.50	1.05	0.31	10.0	1.74	188.6	3	7.8	1.01	146
GTR316	33315	180.	2.	5.	-180.	44.	217.	19.	18.	0.51	1.05	0.30	10.4	1.80	196.9	1	7.9	1.02	144
FCPAD6	33315	203.	0.	0.	-203.	45.	222.	19.	19.	2.26	1.05	0.24	13.7	2.38	229.4	0	10.6	1.37	151
FCPADS	33315	353.	0.	0.	-353.	96.	393.	19.	39.	4.09	1.05	0.28	24.0	4.18	232.1	0	15.0	1.94	144
FCMCDS	33315	182.	0.	0.	-182.	45.	222.	19.	19.	2.07	1.05	0.32	14.2	2.47	266.9	0	9.7	1.28	157
FCMCDS	33315	258.	0.	0.	-258.	76.	326.	19.	31.	3.09	1.05	0.36	20.7	3.60	274.3	0	11.8	1.53	149

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COGENERATION TECHNOLOGY ALTERNATIVES STUDY

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SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

ECS	PROCS	FUEL USE IN BTU*10**6 **COGENERATION CASE** DISTIL	RESIDL	COAL	**NOCOGEN - COGEN** DISTIL	RESIDL	COAL		POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
ONOCGN	33316	0.	39.	202.	0.	0.	0.	A	16.	0.	0.54	0.91	0.	5.7	1.00	277.9	0	7.0	1.00	80
STM141	33316	0.	115.	105.	0.	-76.	97.		16.	3.	0.39	0.91	0.09	4.6	0.80	168.7	-3	7.0	1.00	123
STM141	33316	0.	31.	189.	0.	8.	13.	F	16.	3.	0.68	0.91	0.09	8.6	1.50	353.7	11	6.7	0.96	107
STM141	33316	0.	31.	189.	0.	8.	13.	A	16.	3.	0.60	0.91	0.09	7.1	1.24	290.7	26	6.5	0.93	110
STM088	33316	0.	113.	113.	0.	-74.	89.		16.	2.	0.38	0.91	0.06	4.0	0.69	171.2	-7	7.1	1.01	120
STM088	33316	0.	34.	193.	0.	5.	9.	F	16.	2.	0.65	0.91	0.06	7.9	1.38	339.2	10	6.8	0.98	102
STM088	33316	0.	34.	193.	0.	5.	9.	A	16.	2.	0.58	0.91	0.06	6.7	1.18	285.8	27	6.6	0.95	105
PFBSTM	33316	0.	26.	180.	0.	13.	22.		16.	5.	0.83	0.91	0.15	11.1	1.94	407.1	9	6.6	0.95	114
TISTMT	33316	0.	122.	71.	0.	-83.	131.		16.	7.	0.88	0.91	0.20	23.3	4.05	788.0	0	8.7	1.25	119
TISTMT	33316	0.	21.	172.	0.	18.	30.		16.	7.	1.24	0.91	0.20	29.7	5.16	1004.2	0	8.6	1.23	116
TIHRSG	33316	0.	123.	100.	0.	-84.	102.		16.	4.	0.72	0.91	0.08	20.8	3.61	763.0	0	9.1	1.30	100
TIHRSG	33316	0.	30.	193.	0.	9.	9.		16.	4.	1.05	0.91	0.08	26.8	4.66	984.2	0	9.0	1.29	97
STIRL	33316	126.	16.	55.	-126.	23.	147.		16.	9.	0.45	0.91	0.18	7.2	1.26	196.6	0	7.5	1 07	136
STIRL	33316	0.	142.	55.	0.	-103.	147.		16.	9.	0.45	0.91	0.18	7.3	1.26	196.9	19	6.7	0.95	133
STIRL	33316	0.	16.	181.	0.	23.	21.		16.	9.	0.80	0.91	0.18	13.1	2.27	354.6	12	6.2	0.88	119
HEGT85	33316	0.	0.	217.	0.	39.	-15.	A	16.	16.	1.75	0.91	0.10	40.5	7.05	637.3	0	9.6	1.38	120
HEGT85	33316	0.	0.	507.	0.	117.	-45.	A	16.	48.	2.78	0.91	0.12	77.1	13.40	518.1	0	13.7	1.96	109
HEGT60	33316	0.	1.	209.	0.	38.	-7.	A	16.	16.	1.35	0.91	0.13	34.9	6.07	576.9	0	8.5	1.22	110
HEGT00	33316	0.	24.	202.	0.	16.	-0.	A	16.	6.	0.83	0.91	0.06	19.1	3.32	530.2	0	7.7	1.10	100
FCMCCL	33316	0.	12.	165.	0.	28.	37.		16.	11.	1.14	0.91	0.27	22.4	3.90	604.0	5	7.0	1.01	126
FCSTCL	33316	0.	0.	147.	0.	39.	55.		16.	16.	1.50	0.91	0.39	26.7	4.65	621.2	5	6.8	0.98	150
FCSTCL	33316	0.	0.	149.	0.	40.	57.		16.	16.	1.41	0.91	0.39	26.6	4.63	608.9	6	6.7	0.96	139
IGGTST	33316	0.	11.	177.	0.	28.	25.		16.	11.	1.04	0.91	0.22	22.2	3.87	546.4	4	7.1	1.02	120
GTSOAR	33316	0.	151.	33.	0.	-112.	169.		16.	12.	0.43	0.91	0.24	8.0	1.40	193.5	22	6.4	0.91	138
GTAC08	33316	0.	133.	56.	0.	-94.	146.		16.	9.	0.37	0.91	0.22	6.1	1.07	179.6	149	6.2	0.89	140
GTAC12	33316	0.	140.	36.	0.	-101.	165.		16.	12.	0.40	0.91	0.27	7.0	1.22	184.6	50	6.0	0.86	144
GTAC16	33316	0.	146.	24.	0.	-107.	178.		16.	13.	0.43	0.91	0.30	7.9	1.37	194.2	33	5.9	0.85	145
GTWC16	33316	0.	154.	19.	0.	-115.	185.		16.	14.	0.44	0.91	0.28	8.3	1.45	191.5	26	6.1	0.87	142
CC1626	33316	0.	163.	0.	0.	-124.	202.		16.	16.	0.71	0.91	0.32	10.0	1.75	210.4	15	6.3	0.90	155
CC1626	33316	0.	190.	0.	0.	-139.	241.		16.	21.	0.63	0.91	0.35	10.8	1.88	194.2	14	6.2	0.89	145
CC1622	33316	0.	159.	0.	0.	-120.	202.		16.	16.	0.68	0.91	0.34	9.7	1.68	207.5	18	6.1	0.88	158
CC1622	33316	0.	174.	0.	0.	-128.	224.		16.	19.	0.60	0.91	0.36	10.0	1.74	196.3	19	6.0	0.86	147
CC1222	33316	0.	158.	0.	0.	-119.	202.		16.	16.	0.67	0.91	0.34	9.2	1.61	199.6	20	6.1	0.87	159
CC1222	33316	0.	172.	0.	0.	-127.	223.		16.	19.	0.59	0.91	0.36	9.5	1.65	188.3	21	5.9	0.85	148
CC0822	33316	0.	149.	11.	0.	-109.	191.		16.	15.	0.54	0.91	0.34	8.3	1.45	195.6	29	5.9	0.84	149
STIG15	33316	0.	212.	0.	0.	-172.	202.		16.	16.	0.82	0.91	0.12	10.8	1.87	173.7	0	7.8	1.12	134
STIG15	33316	0.	4615.	0.	0.	-3351.	4302.		16.	515.	8.40	0.91	0.17	145.9	25.39	107.9	0	63.9	9.14	267
STIG10	33316	0.	199.	0.	0.	-160.	202.		16.	16.	0.75	0.91	0.18	10.0	1.73	170.9	0	7.3	1.05	140
STIG10	33316	0.	453.	0.	0.	-336.	462.		16.	48.	1.03	0.91	0.22	17.4	3.02	131.0	0	9.8	1.41	120
STIG1S	33316	0.	193.	0.	0.	-154.	202.		16.	16.	0.72	0.91	0.20	9.5	1.65	167.7	3	7.1	1.01	144
STIG1S	33316	0.	285.	0.	0.	-216.	300.		16.	28.	0.75	0.91	0.23	11.9	2.00	142.2	0	7.8	1.11	131
DEADV3	33316	0.	182.	0.	0.	-143.	202.		16.	16.	0.78	0.91	0.24	13.3	2.31	248.2	2	7.2	1.03	143
DEADV3	33316	0.	293.	0.	0.	-215.	332.		16.	32.	0.91	0.91	0.29	22.0	3.83	256.3	0	8.6	1.22	129

GENERAL ELECTRIC COMPANY
COGENERATION TECHNOLOGY ALTERNATIVES STUDY
REPORT 5.2
SUMMARY OF FUEL SAVED BY TYPE & ECONOMICS

		FUEL USE IN BTU*10**6																	
		COGENERATION CASE			**NOCOGEN - COGEN**														
ECS	PROCS	DISTIL	RESIDL	COAL	DISTIL	RESIDL	COAL	POWER REQD MW	COGEN POWER MW	O&M	POWER /HEAT RATIO	FESR	CAPITAL COST *10**6	NORM COST	$/KW EQVL	ROI (%)	LEVL CHRG	NORM ENRG	WRTH
DEHTPM	33316	0.	146.	21.	0.	-107.	181.	16.	13.	0.60	0.91	0.31	11.1	1.93	270.7	12	6.4	0.92	140
DESOA3	33316	191.	0.	0.	-191.	[illegible]	202.	16.	16.	0.85	0.91	0.21	16.0	2.78	284.6	0	9.0	1.29	142
DESOA3	33316	351.	0.	0.	-351.	9[illegible]	375.	16.	37.	1.17	0.91	0.25	31.3	5.45	304.8	0	12.7	1.01	132
DESOA3	33316	0.	191.	0.	0.	-15[illegible]	202.	16.	16.	0.85	0.91	0.21	16.0	2.78	284.6	0	7.8	1.12	138
DESOA3	33316	0.	351	0.	0.	-260.	375.	16.	37.	1.17	0.91	0.25	31.3	5.45	304.8	0	10.5	1.50	125
GTSOAD	33316	130.	12.	40.	-130.	27.	162.	16.	11.	0.38	0.91	0.25	6.4	1.11	167.0	17	6.9	0.99	146
GTRA08	33316	163.	0.	0.	-163.	39.	202.	16.	16.	0.61	0.91	0.32	10.4	1.81	218.0	0	7.2	1.04	158
GTRA08	33316	178	0.	0.	-178.	46.	224.	16.	19.	0.52	0.91	0.34	10.8	1.87	206.0	0	7.3	1.04	148
GTRA12	33316	161.	0.	0.	-161.	39.	202.	16.	16.	0.60	0.91	0.33	10.4	1.82	221.2	1	7.2	1.03	159
GTRA12	33316	173.	0.	0.	-173.	45.	220.	16.	18.	0.52	0.91	0.34	10.7	1.86	210.8	1	7.2	1.02	149
GTRA16	33316	160.	0.	0.	-160.	39.	202.	16.	16.	0.59	0.91	0.34	10.8	1.87	229.2	1	7.2	1.03	158
GTRA16	33316	166.	0.	0.	-166.	42.	210.	16.	17.	0.52	0.91	0.34	10.8	1.88	222.3	2	7.1	1.02	148
GTR208	33316	149.	5.	16.	-149.	34.	185.	16.	14.	0.45	0.91	0.29	8.5	1.48	194.4	4	7.0	1.00	146
GTR212	33316	155.	2.	8.	-155.	37.	194.	16.	15.	0.47	0.91	0.31	9.2	1.59	201.6	5	7.0	1.00	147
GTR216	33316	156.	1.	5.	-156.	38.	197.	16.	15.	0.48	0.91	0.33	9.6	1.68	211.2	5	7.0	1.00	148
GTRW08	33316	175.	0.	0.	-175.	39.	202.	16.	16.	0.64	0.91	0.27	10.7	1.86	208.4	0	7.7	1.11	153
GTRW08	33316	216.	0.	0.	-216.	55.	253.	16.	22.	0.57	0.91	0.30	12.0	2.08	188.5	0	8.1	1.16	143
GTRW12	33316	171.	0.	0.	-171.	39.	202.	16.	16.	0.64	0.91	0.29	10.7	1.86	214.2	0	7.6	1.08	155
GTRW12	33316	212.	0.	0.	-212.	55.	256.	16.	23.	0.57	0.91	0.32	12.0	2.09	194.0	0	7.9	1.13	145
GTRW16	33316	169.	0.	0.	-169.	39.	202.	16.	16.	0.64	0.91	0.30	11.0	1.91	221.5	0	7.6	1.08	155
GTRW16	33316	200.	0.	0.	-200.	51.	242.	16.	21.	0.56	0.91	0.32	11.9	2.08	204.1	0	7.7	1.11	145
GTR308	33316	180.	0.	0.	-180.	39.	202.	16.	16.	0.57	0.91	0.25	9.7	1.68	182.7	0	7.7	1.10	152
GTR308	33316	187.	0.	0.	-187.	42.	210.	16.	17.	0.50	0.91	0.26	9.6	1.67	175.6	0	7.7	1.10	142
GTR312	33316	168.	0.	0.	-168.	39.	202.	16.	16.	0.59	0.91	0.30	9.8	1.71	200.0	0	7.3	1.05	157
GTR312	33316	181.	0.	0.	-181.	44.	220.	16.	18.	0.50	0.91	0.31	10.0	1.74	188.6	0	7.3	1.05	147
GTR316	33316	168.	0.	0.	-168.	39.	202.	16.	16.	0.60	0.91	0.30	10.2	1.78	207.5	0	7.4	1.06	156
GTR316	33316	180.	0.	0.	-180.	44.	217.	16.	18.	0.51	0.91	0.31	10.1	1.80	196.9	0	7.4	1.06	146
FCPADS	33316	186.	0.	0.	-186.	39.	202.	16.	16.	1.95	0.91	0.23	12.4	2.16	228.3	0	9.6	1.37	151
FCPADS	33316	353.	0.	0.	-353.	96.	393.	16.	39.	4.09	0.91	0.28	24.0	4.18	232.1	0	14.5	2.08	145
FCMCDS	33316	167.	0.	0.	-167.	39.	202.	16.	16.	1.85	0.91	0.31	12.9	2.24	263.7	0	8.9	1.27	158
FCMCDS	33316	258.	0.	0.	-258.	76.	326.	16.	31.	3.09	0.91	0.36	20.7	3.60	274.3	0	11.4	1.63	150